

Machine and Tool **BLUE BOOK**

A DIGEST OF THE METAL WORKING INDUSTRY

SEPTEMBER 1948

THIS MONTH

Stamping Operations at Norris Mfg.

Shear Cutting of Motor Shafts

Cams, Tooling for Single Spindle Auto-
matics

Sell the World's Best Investment

NMTBA Sales Refresher Course

What's New in Metalworking

Available Literature

Advertisers' Products Index

Index to Advertisers

COMPLETE INDEX ON PAGE 5

A HITCHCOCK PUBLICATION

MARVEL *Metal Cutting* SAWS

Better Machines—Better Blades

Regardless what type hack saw machines and metal-cutting band saw machines you use, MARVEL BLADES will improve performance. There are sound reasons why this is true; practical reasons that are easily understood and demonstrated.

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MARVEL Band Saws are of selected quality. They come ready for use, pre-welded to size for each make and model saw. Individually boxed, they are protected against kinking, rusting or damage to teeth!

Write for Blade Catalog Sheet.



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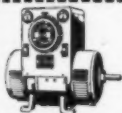


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Incorporating all of the advance A. C. welding features that operators have been clamoring for . . . the new Hobart A. C. Welders are unequaled in performance and ease of operation. For production welding and cutting costs they're rapidly being adopted by smart management who know the best in arc welding equipment. They're the choice of operators who are partial to A. C. welding because they start faster, hold a better arc and produce good welds in less time. Fill out and mail the coupon today for complete information on Hobart A. C. Welding advantages!

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Gas Drive Portable Welder



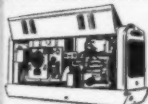
Electric Motor Driven Welders



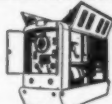
Weldmobile (Self-Propelled)



Transformer Type



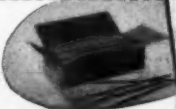
Combination Welder & Power



ACAC Gas Drive Welder, Power

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Send for new catalog showing complete line. There's a Hobart electrode for every purpose.



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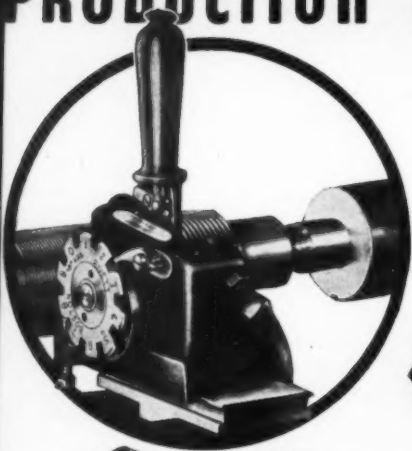
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for
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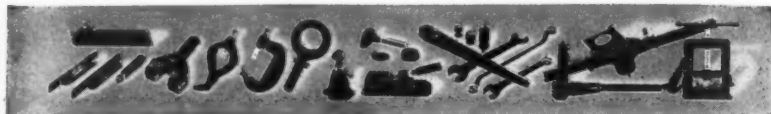
See that each lathe, planer and shaper operator has the correct ARMSTRONG TOOL HOLDERS for each operation he performs. Equip each machine with its full complement of ARMSTRONG Setting-up Tools. Use better balanced, handier ARMSTRONG WRENCHES on machines and assembly lines. Specify ARMSTRONG Drop Forged "C" Clamps and Lathe Dogs . . . Today, only quality tools can be truly economical.

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Published Monthly

Machine and Tool BLUE BOOK

Volume 44, No. 9

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SEPTEMBER, 1948

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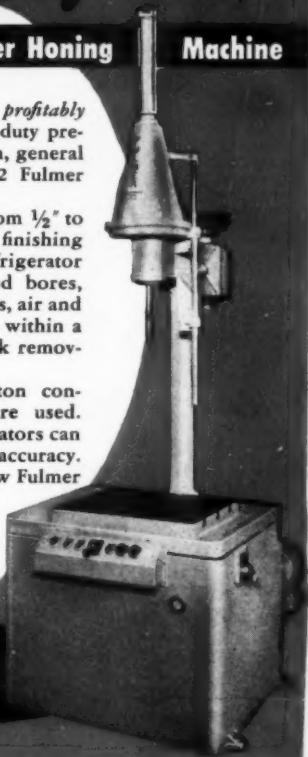
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Now, both large and small shops can profitably apply the many advantages of fast, heavy-duty precision honing to a wide range of short-run, general purpose work—with the new Model 412 Fulmer Honing Machine.

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12" Stroke • Full Hydraulic Reciprocation



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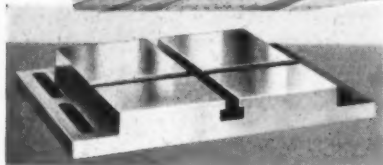
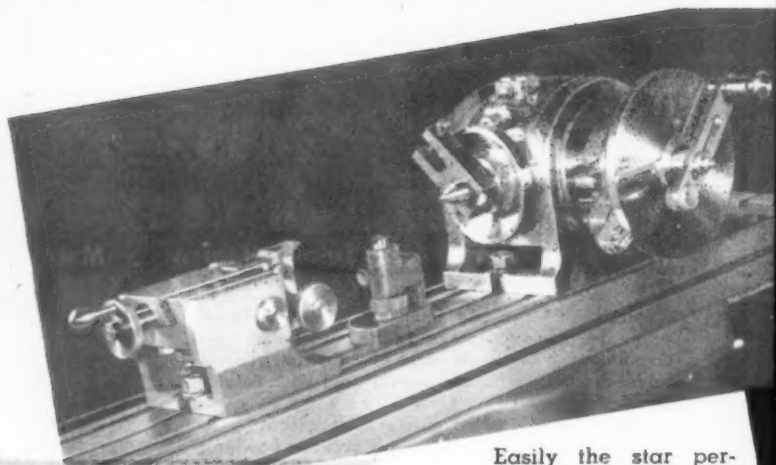
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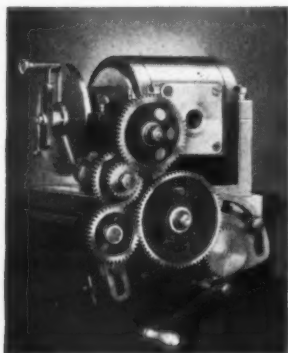
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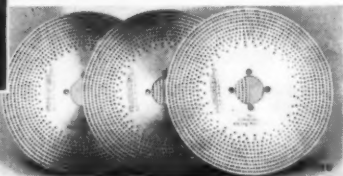
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▲ **RIGHT ANGLE PLATES** for offsetting the Dividing Head from the table T-slots, or setting it up to face the machine spindle. Publication M-644-1.



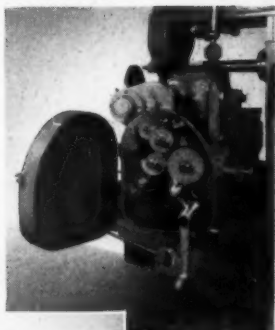
▲ **OPEN TYPE DRIVING MECHANISM** for driving Dividing Heads mounted on the older CINCINNATI knee type millers. Lead range .67" to 80.6". Publication M-644-1.



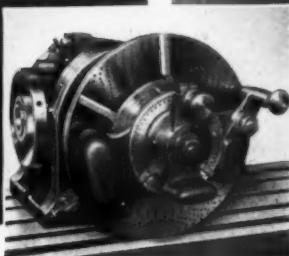
HIGH NUMBER INDEXING ATTACHMENT. These plates interchange with standard index plate supplied with CINCINNATI Dividing Heads. Publication M-987.

Easily the star performer on milling machines, the CINCINNATI Dividing Head has a strong supporting team of eight attachments which gives it extra value in any shop. Each attachment lends a hand in milling specific types of dividing head work. Some of them can be employed to advantage in your shop. It's easy to see how; just look at the whole team pictured here. Then write for literature on the ones in which you are interested.

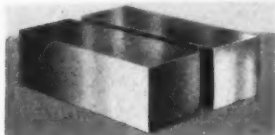
SUPPORTING TEAM for the STAR PLAYER



↑ **ENCLOSED DRIVING MECHANISM** for driving Dividing Heads mounted on the newer CINCINNATI plain, universal, and vertical millers. Lead range $2\frac{1}{2}$ " to 100". Publication M-1016-2.

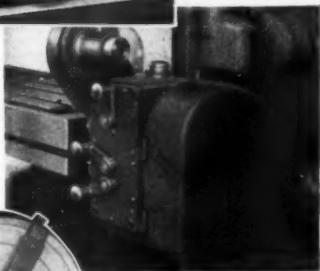


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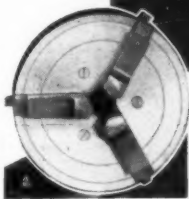


↑ **RAISING BLOCKS.** Give your Dividing Head the benefit of accurately made Raising Blocks. Supplied in pairs: 2", $2\frac{1}{2}$ " and 3" high. Publication M-644-1.

↑ **CHUCK.** Three jaw universal type. Has threaded flange to facilitate mounting on spindle nose of Dividing Head. 6" and 9" sizes. Publication M-644-1.



↑ **SHORT AND LONG LEAD DRIVING MECHANISM** for driving Dividing Heads mounted on Universal Dial Type Millers only. Lead range .010" to 1000". Publication M-1166.



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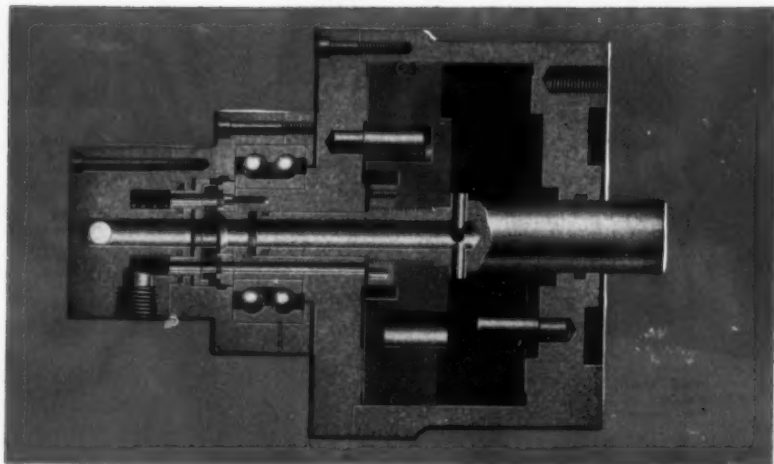
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Precision forged aluminum alloy construction with lapped bores. Light weight . . . low flywheel effect . . . long troublefree service.

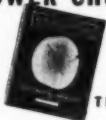
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Entire cylinder statically balanced after assembly for smooth operation at speeds up to 3500 r.p.m.

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72 HOLES

where they belong

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Accurate hole spacing—accurate hole position—are maintained, and assembly is smooth and trouble free.

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As a press, they offer high production with low investment. As a Press Brake, their low set-up costs, quick change-overs and versatility bring profits.

Write for Catalog B-2A for complete description of the extensive line of Cincinnati Press Brakes, with many illustrations of the diversified uses of these machines.

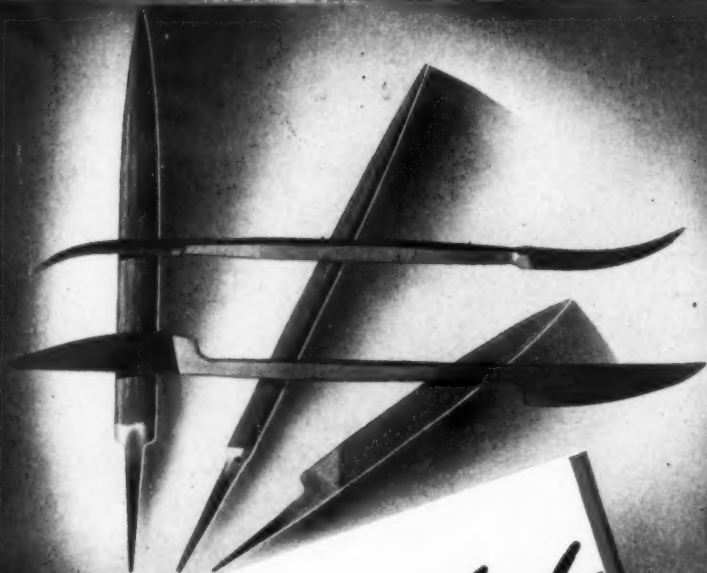
● Courtesy . . . MIRM & BLUM, Cincinnati, Ohio



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CINCINNATI 25, OHIO U.S.A.

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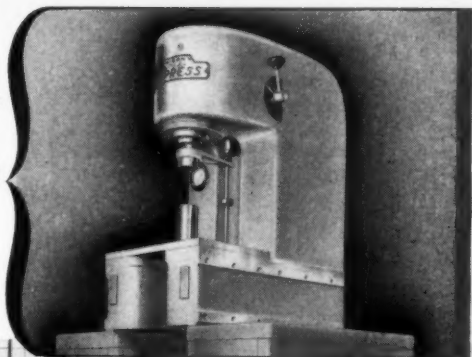
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Easy-to-Handle TUMICO SNAP GAGE Quickly Measures 15" Ground Shoulder Diameter

Light Tubular Steel Frame Permits "Feather Touch" Feel for Accurate Gaging of Forged Gear Hub O.D. During Grinding Operation.

Through the use of this Tumico Snap Gage, overall measuring time is sharply reduced. Gaging the ground shoulder O. D. is as simple as shown in the illustration. Machine operator merely "feels" for $\pm .001$ " dimension and is assisted by light tubular frame structure which is 25 to 50% lighter than solid frame snap gages.

These precision instruments will cut your measuring time and improve work quality. Take advantage of Tumico standard snap gages from 5 1/2" to 24" or special sizes to suit requirements.

MORE TIME SAVING—PROFIT PRODUCING TUMICO PRODUCTS FOR YOUR NEEDS.



1. Tumico Caliper and Wire Gage is a combination measuring instrument. It will measure sheets and plates from 0" to 4". Wire gage slots are U. S. Standard No. 1 through No. 30. Markings are deep etched for rapid reading.



2. Tumico Tubular Micrometers feature "feather-touch" feel for making repetitive precision measurements. They are available in the

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4. Tumico Thrift Micrometers are economically priced units having drop forge steel frames, hardened anvils and spindle tips. They are available with ratchet stop and lock ring, or Vernier scale in size 0" to 6".

Write Today

—for further information about Tumico Precision Measuring Instruments for all standard and special requirements.

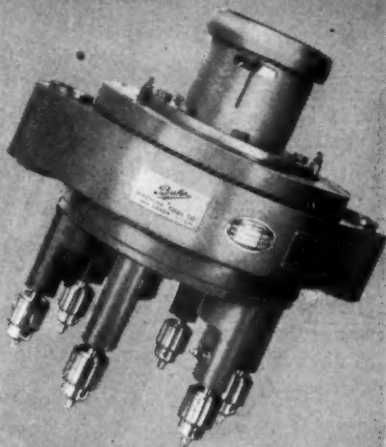
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SPECIFY
Buhr

**MULTIPLE SPINDLE
DRILLING AND
TAPPING HEADS
FOR
PRODUCTION**

**BUHR BUILDS ALL
TYPES OF SPECIAL
FIXED CENTER AND
ADJUSTABLE
MULTIPLE HEADS
FOR HIGH PRODUCTION
UNDER SEVERE
OPERATING
CONDITIONS**



Buhr Standard Adjustable Drilling and Tapping Heads are engineered and built to deliver high production at low unit cost. Fully adjustable, 2 to 8 spindles, for short or long runs. Rapid set up, models for all presses. Anti-friction bearing throughout. All gears are shaved, spline broached and induction hardened. Shafts and spindles splined.

Model 06-I-2 shown with No. 2 Jacobs Chucks also is available with spindles for Buhr Collets or with No. 1 Morse Taper. Drill capacity is $\frac{5}{8}$ " cast iron, minimum between center, $1\frac{1}{4}$ ". Buhr steel-bushed guide-bar bosses are available for precision alignment with fixture.

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On this job, three accurate bends are made in different planes, meeting close tolerances, without scratching the polished tubes ... at a production rate of 2 pieces per minute or 6 bends per minute on a Pines Bending machine. Prior production on other equipment was less than one piece per minute.

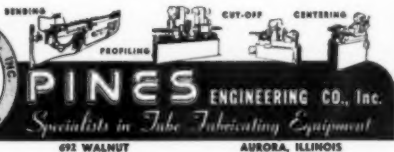
Every Pines Bending machine has ample capacity and power to produce a full range of bends and handle heavy-walled stock on SERPENTINE BENDS, STACKED COILS, RETURN BENDS, ROUND COILS, SQUARE and RECTANGULAR TUBES, SPECIAL ROLLED and EXTRUDED SECTIONS and other bent forms ... with the accuracy required and without wrinkling.

Write for Pines engineering service to show you how to produce quality bends on a high production basis and at lower costs ... no obligation, of course.



Now

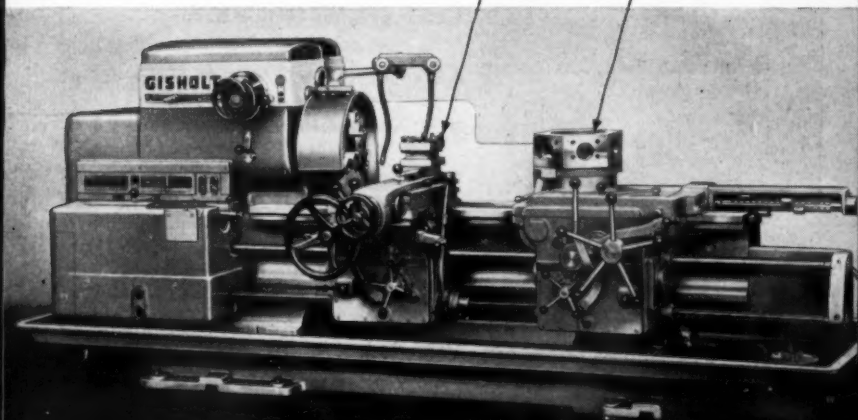
send for your **FREE** copy of the new Pines Catalog 102A describing the Pines Principle of Bending and Pines Bending Machines.



RIGID TURRETS!

—for Rigid Standards of Accuracy!

It's one of the reasons why seasoned production men insist on Gisholt. The square turret tool post and hexagon turret are positioned by double-beveled clamping rings which provide exceptional clamping pressure with easy hand motion. Moreover, on each indexing operation, turret faces are rigidly locked in true position by hardened and precision-ground locking pins to insure unfailing accuracy.



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GISHOLT MACHINE COMPANY
Madison 10, Wisconsin

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TURRET LATHES • AUTOMATIC LATHES • BALANCERS • SUPERFINISHERS • SPECIAL MACHINES

In Tools, Dies, Jigs, Fixtures Sunnen Precision Honing Machines PRODUCE STRAIGHT ROUND HOLES



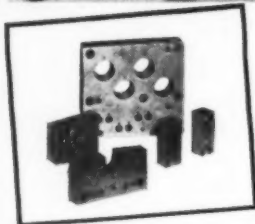
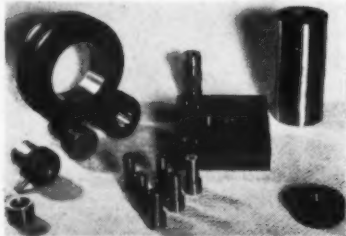
✓ **Accurate Within .00005"
Up to 10 Times Faster
Than Lapping**

Tool and die shops and tool rooms everywhere are turning to Sunnen Precision Honing as a fast, economical method of producing smooth, accurate holes.

Here's why they use it to fit dowel pins, ejector pins, die and jig bushings—and to finish ring gauges and extrusion dies.

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- Extremely accurate — tolerances held to twenty millionths of an inch
- Wide range of sizes — hones any diameter from .120" to 2.625"
- Corrects distortion, bell-mouth, taper, out-of-round holes
- Machine — completely equipped with honing tools for range .120" to 2.625" — less than \$1400

Write today for bulletin giving complete details—or call in a Sunnen engineer.



TOOL ROOM MANDREL SETS — Now available for your use. These convenient Mandrel Sets consist of completely assembled honing units shipped in time and space-saving storage racks. Four sets cover complete range from 1/8" to 2 5/8" in diameter. Save time and money by purchasing complete sets.

SUNNEN PRODUCTS COMPANY • 7987 Manchester Ave., St. Louis 17, Mo.

Canadian Factory: Chatham, Ontario

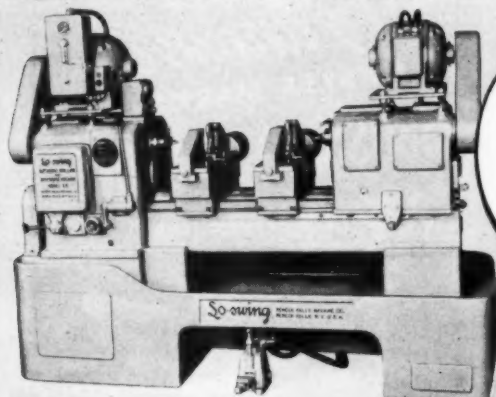
375

SUNNEN *Precision Honing*

TRADE MARK REG. U. S. PAT. OFF. - MACH. REG. 170000

MACHINE OF THE MONTH

PREPARED BY THE SENECA FALLS MACHINE CO. "THE So-swing PEOPLE" SENECA FALLS, NEW YORK



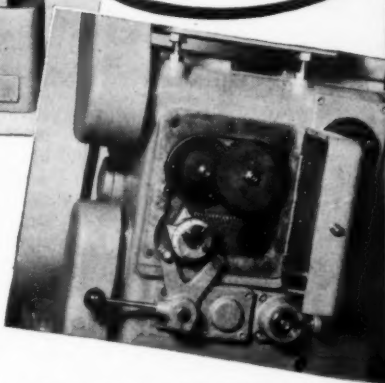
**REDUCE
YOUR
CENTERING
COSTS**

WITH A So-swing AUTOMATIC DRILLING and CENTERING MACHINE

• The So-swing Model "CS" has demonstrated a marked ability to cut costs on both mass production and short-run jobs. Both speeds and feeds can be quickly changed and automatic cycle time held to a strict minimum due to its exclusive HIGH SPEED, ADJUSTABLE RAPID TRAVERSE MECHANISM.

TWO INDEPENDENT, MOTOR-DRIVEN HEADS provide the correct spindle speeds for EACH head when different size drills or combination countersinks are used. Cam operated drilling spindles assure POSITIVE ACTION...cams will operate for any depth of cut within machine's capacity and DO NOT REQUIRE CHANGING. The Rapid Traverse Mechanism for both heads is controlled by cams which are PRESET TO A GRADUATED DIAL...much more efficient than the "set and try" method.

Standard, quick-acting, equalizing, air-operated vises are available and may be arranged to operate singly or



in pairs. Ample distance from the bed to the spindle provides sufficient room for special work-holding fixtures which are available as extra equipment. ELECTRIC MOTORS ARE THE STANDARD FOOT MOUNTING TYPE and may be furnished in sizes from 1 to 3 H.P.

Model "CS" is available in four standard sizes, 18", 42", 66" and 90" between drills. Write for full information on this new cost-cutting equipment.

SENECA FALLS MACHINE CO., SENECA FALLS, N. Y.

PRODUCTION COSTS ARE LOWER WITH So-swing

Emboss Your Own Metal Tags

*At
Low Cost*

with a

Pannier

"MASTER MARKER"

EMBOSSING MACHINE



**Get a Completely
Embossed Tag
Every 1½ Seconds!**

See this and other advanced Pannier marking machines at Booths 252 and 253, Iron and Steel Institute Show, Cleveland, Ohio, September 28 to October 1. Or write for complete information.

Up to 20 characters at a time are embossed on 50 metal tags per minute with this efficient, easily-operated Pannier "Master Marker." Characters are carried on interchangeable slides and positioned by hand wheels on side of machine head. Die slides are engraved to specification—including standard code characters of the Concrete Reinforcing Steel Institute. Reels of plain or punched tag blanks, nicked and notched for easy separation, are supplied by Pannier, and mount on machine for safe, convenient feeding into dies. A rewind reel is also available. Machine is available with foot or power operation.

OFFICES:

Chicago, Ill. Los Angeles, Calif. Youngstown, O.
Philadelphia, Pa.

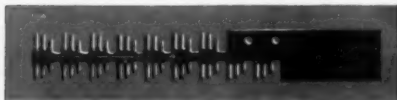


THE PANNIER CORPORATION

203 Pannier Building

Pittsburgh 12, Pa.

**7,200 Pieces per hour
from 1⁹/₁₆" x .042"
C.R.S. Coil Stock using ...**



DANLY Precision DIE SET

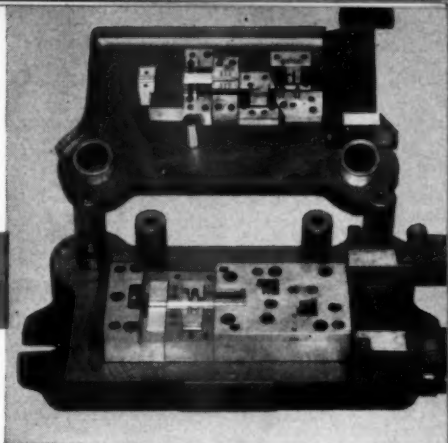


Photo courtesy of Federal Tool Corporation, Chicago

Tolerance of .001" held on 10-station progressive die

Here's another example of how Danly Precision Die Sets maintain close tolerance punch and die relationship on high production work.

The part illustrated, a nut chopper cutter, is produced on a 10-station progressive die at a rate of 7,200 pieces per hour. An average of 100,000 pieces are obtained between grinds. Tolerance of .001" between stations is maintained.

**save
time**

USE DANLY NATION-WIDE
DIE SET ASSEMBLY SERVICE

Assembly plants (marked with stars) stock interchangeable parts for quick assembly and delivery of any standard die set to your specifications.

- Chicago 50, 2100 S. 52nd Ave.
- Cleveland 14, 1550-E. 33rd St.
- Dayton 2, 990 E. Monument Ave.
- Detroit 16, 1549 Temple Ave.
- Grand Rapids, 113 Michigan Ave., N.W.
- Long Island City 1, 47-28 37th St.
- Los Angeles 54, Ducommun Metals & Supply Co., 4890 S. Alameda
- Milwaukee 2, 111 E. Wisconsin Ave.
- Philadelphia 44, 18 W. Cheltenham Ave.
- Rochester 4, 16 Commercial St.

To date the same original Danly Die Set has held the tolerance required for a total of 1,500,000 pieces, and under normal operating conditions, will continue to give many more hours of profitable service.

SEQUENCE OF OPERATIONS—The roll stock is fed automatically through the following sequence of operations: (1) Pierce and notch right edge, (2) pilot, (3) notch left edge, (4) rough form center, (5) finish form center, (6) idle, (7) twist, (8) idle, (9) idle, (10) cut off.

HELPFUL ENGINEERING SERVICE—For helpful engineering service on Die Sets of any size, standard or special, for any type of press operation, consult Danly without obligation.

write for this free bulletin
Illustrates how you may use Danly's special machining and welding service to save additional time and money.



DANLY

DANLY MACHINE SPECIALTIES, INC.
2100 SOUTH 52ND AVENUE, CHICAGO 58, ILLINOIS



35 YEARS OF DEPENDABLE SERVICE
TO THE STAMPING INDUSTRY

PRECISION DIE SETS • STANDARD AND SPECIAL • MECHANICAL PRESSES AND PRESS EQUIPMENT

Why "M-11" produces



MORE TAPPED HOLES PER TAP

M-11 is a chrome-cobalt high speed steel used exclusively by Detroit Tap and Tool Company for taps, thread gages and thread milling cutters. Some of the reasons for its use are

COBALT . . . Takes human element out of hardening. **AUTOMATICALLY UNIFORM HEAT-TREAT . . .** also increases "red hardness."

CHROMIUM . Increases toughness and strength. **LESS BREAK-AGE . . .** Deeper, more uniform hardness penetration. **SHARPENING DOESN'T CHANGE IT . . .** Resists Corrosion. . . Greater abrasion resistance. **MORE PIECES PER SHARPENING.**

This combination of chromium and cobalt in Detroit Tap's M-11 high speed steel is available to you at no increase in cost over quality taps made of ordinary high-speed steels. And back of every M-11 tap, thread gage and thread milling cutter is Detroit's **SERVICE** — a service which can make the proud claim:


WE'VE NEVER "SHUT DOWN" A LINE YET!!

DETROIT
TAP & TOOL CO.
9422 BUTLER STREET DETROIT 11 U.S.A.



The Home of
"M-11"

**CHROME-COBALT
HSS TAPS, THREAD
MILLING CUTTERS &
THREAD GAGES**



**Men who
know
say...**

"USE SKIL Drills"

Ask about SKIL Drills anywhere in
Industry! The answers you get will all add up to this:
Don't just drill it... SKIL Drill it!

Ask workers, and you'll hear about better balance,
easier handling, faster production. Ask engineers, and you'll hear
about extra power, less weight, better design and construction.
Ask purchasing departments, and you'll hear about longer service,
finer features and lower costs.

Then grab that phone and ask your SKIL Tool Distributor to
demonstrate SKIL Drills today. 26 Powerful models.

SKILSAW, INC.

8000 Maroon Ave., Chicago 30, Ill.
Factory Branches in Principal Cities
In Canada: SKILTOOLS LTD.,
66 Portland St., Toronto, Ont.

SKIL ELECTRIC
Tools
PNEUMATIC

Woodworth Engineered Products

PRECISION GAGES

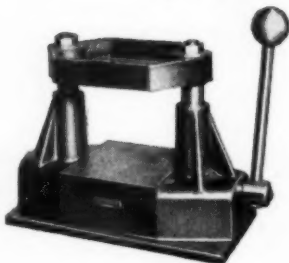


Woodworth manufactures a complete line of thread ring and thread plug as well as cylindrical plug and ring gages. Also produce special gages to customer blue-prints.

PRECISION PARTS



N. A. Woodworth engineering gives you plus value in precision parts. Production men with "know how" combined with well equipped plant are pace setters in aircraft engine and radar assembly fields.

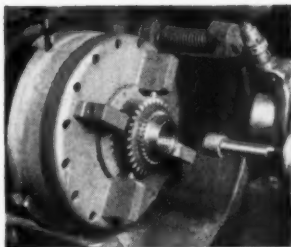


CONE-LOK JIGS

Woodworth Cone-Lok Jigs are noted for their mechanical simplicity and "life-time" construction.

DIAPHRAGM CHUCKS

Chucks engineered and built by Woodworth guarantees the ultimate in precision gear chucking.



ACCURACY YOU CAN TRUST

WOODWORTH

N. A. WOODWORTH CO., 1300 EAST NINE MILE ROAD • DETROIT 20, MICHIGAN
COMPLETE LINE OF PRECISION GAGES • DIAPHRAGM CHUCKS • CONE-LOK JIGS

NEW

Stockmaster

ROLL FEEDS

V&O "STOCKMASTER" line of ROLL FEEDS have been designed to meet present day needs of feeding material. They are accessible and readily adjustable within capacity to varying lengths of feeds.

The clutch on the "STOCKMASTER" FEED is of the friction type and will operate to a very close degree of accuracy. These ROLL FEEDS are mounted on a special bolster, which makes it possible to remove and replace the ROLL FEED UNIT from end to a PRESS without disturbing its alignment.

In addition to the V&O ROLL FEEDS, which are made in either single or double type; scrap cutters and straightening rolls can be attached as separate items either at the time of installation or at a later date, without the need of additional bolster equipment. Our "STOCKMASTER" ROLL FEEDS are adjustable for height.

The "STOCKMASTER" FEEDS, as well as V&O STANDARD ROLL FEEDS, are applicable to other makes of PRESSES as well as those of V&O manufacture. We are also prepared to supply STOCKREELS, STOCKCRADLES or other Material HANDLING devices.



**The V&O PRESS
COMPANY**
DIVISION OF ROCKWELL MANUFACTURING CO.
HUDSON, N. Y.



TRY THIS...

ON YOUR BEST TOOL ROOM LATHE!



Take a lathe—your best tool maker's lathe. Chuck a piece of $\frac{5}{8}$ " SAE 1050 Bar Stock. Sharpen up a tool and mount it in the tool post. Then turn the stock down to a diameter of .007" as is being done in the illustration above—a real job if you can do it, and if you do, you'll be certain your lathe has both rigidity and accuracy.



The piece pictured at the left was turned on a Hendey 9" x 24" Tool and Gage Maker's Lathe. You saw it done if you visited Hendey at the Machine Tool Show. You can see it done any day you choose to call on Hendey.

Though you may never be called on for such a job in your tool room it's a sure thing you can use a lathe that has all the properties needed for such a job. For full particulars write for the Hendey 9" x 24" Tool and Gage Maker's Lathe Catalog.

The Hendey Machine Company

Hendey

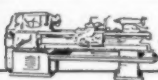
Main Office and Plant — Torrington, Connecticut

Offices — N. Y., Chicago, Boston, Detroit, Rochester, Los Angeles, San Francisco

Representatives in — Philadelphia, Cleveland, Pittsburgh

TOOL ROOM LATHES

9"-12"-16"-18"-20"-24"



SHAPERS

12"-16"-20"-24"-28"



Conomatic Progress Reporter

General Electric has a new thin asbestos paper for use as insulation in high temperature electric equipment.

Progress with Conomatics

Alabama Power Co. is conducting a second series of tests on the method of producing combustible gases from coal by burning it underground.

Conomatics for Progress

The 1" 6-Spindle Conomatic is the first multi-spindle automatic that provides change of tool slide working travel for all slides without cam change.

Progress with Conomatics

A new secret alloy for gun barrels is said to greatly increase the life of all sizes from 16-inch to machine guns.

Conomatics for Progress

An automatic counter made by Potter Instrument Co. of Flushing, N. Y., is said to count stacked sheets of paper as fast as 1,600,000 per second. The counter can also be used on other small parts.

A process for making cheap barium chloride is reported from the University Department of Chemical Technology of Bombay, India.

Progress with Conomatics

Industrial Research Institute of the University of Chattanooga claims to have produced a transparent plastic so hard that it is practically scratchproof.

Conomatics for Progress

Germ-free cement is being made by North American Cement Corp.

Progress with Conomatics

Tests made by Allen B. DuMont Laboratories indicate that television is not restricted to the line-of-sight but can be received up to 125 miles.

Conomatics for Progress

The Army Signal Corps has developed an electric battery that will function at 100 degrees Fahrenheit.

Dayton, Ohio, is planning rail-plane service to its municipal airport. This system of transportation uses a suspended car and has been tried in Europe for about ten years.

Progress with Conomatics

Goodrich has a new air hose that is claimed to be as light and flexible as a lamp cord.

Conomatics for Progress

A new mineral (zinc tungstate) has been discovered in Argentina and named Sanmartinitite after a national hero.

Progress with Conomatics

Patent No. 2,444,045 covers a method of safely removing high explosives from surplus shells in order to recover both the explosive and the steel.

Conomatics for Progress

A new weaving machine is under development by Warner & Swasey. It is claimed to produce cloth about 2½ times as fast as conventional machines.

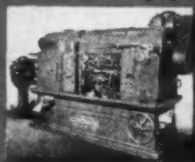
Progress with Conomatics

Owens-Corning Fiberglas Corp. makes a transparent glass cloth for use in greenhouses in place of glass panes.

Progress



...with a CONOMATIC



The shifting lever shown is made from ½" SAE 1120 by a 1½" Eight in 26 seconds.

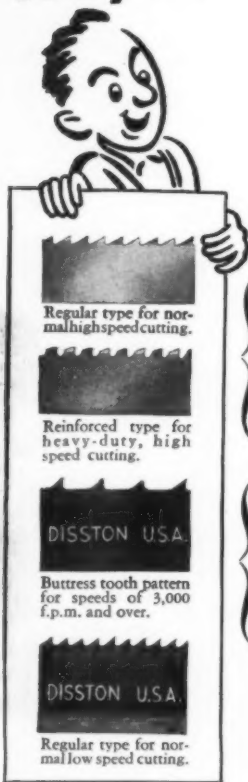
CONE

AUTOMATIC MACHINE CO., INC.
WINDSOR, VERMONT, U.S.A.

24

One of the 4 is EXACTLY RIGHT for your metal cutting...

DISSTON BAND SAWS



No matter what metals you cut nor at what speeds you operate, Disston has the right band saw blade to speed up your work, reduce down time and cut costs.

HARDENED THROUGHOUT

For high speed cutting of non-ferrous metals, plastics and many other materials. Two types (Regular and reinforced). Also recommended for friction cutting of ferrous metals at speeds of not less than 12,000 f.p.m. All sizes.

HARD EDGE, FLEXIBLE BACK

Hardened on tooth edge only for greater flexibility and longer life. Two types (Regular type for general metal cutting; Buttress tooth specially recommended for magnesium and aluminum alloys). All sizes. 100 ft. coils, 1/8" to 1/2", packed in the handy Disston Safety Reel.

ANOTHER COST-CUTTING TIP

Use these Disston Metal-Cutting Tools:
FILES... HACK SAW BLADES... CIRCULAR SAWS... CARBOLOY FITTED CIRCULAR SAWS... TOOL BITS.



Order from your Disston Distributor,
or write direct for further particulars

HENRY DISSTON & SONS, INC., 949 Tacony, Philadelphia 35, Pa., U.S.A.

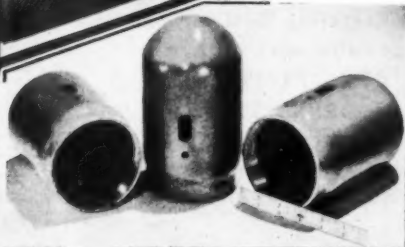
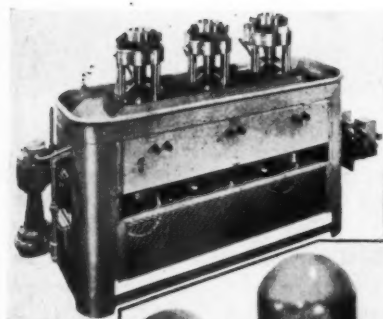
In Canada, write: 2-20 Fraser Ave., Toronto 1, Ont.

"Tap it with a
PRUTTON

Tapmaster"

**3 TAPPING
MACHINES
IN**

1



These GAS CYLINDER CAPS were tapped at a rate of 300-350 per hour on a No. 30 Tapmaster. Tap is a 3½" x 11 pitch of the solid adjustable type. Built for heavy duty

tapping, this machine handles the range of 1½" to 4", with production figures varying between 300 and 500 pieces per hour.

WRITE FOR . . .

. . . DESCRIPTIVE BULLETIN

D. H. PRUTTON MACHINE & TOOL CO.

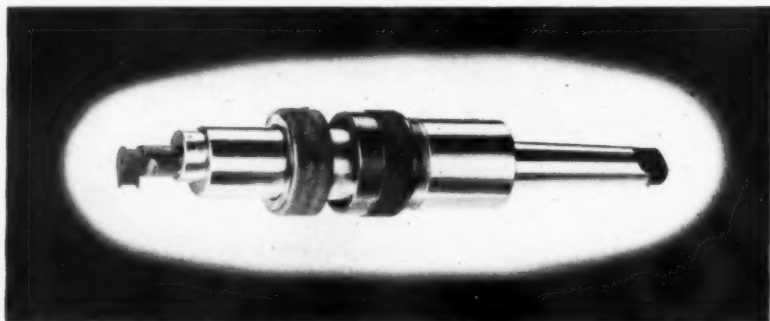
5295 W. 130th St.

CLEVELAND 11, OHIO

RECESSING TOOLS

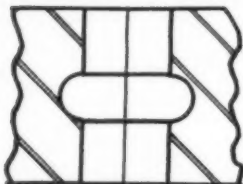
AN OLD NAME . . . A NEW TOOL

by **MAXWELL**

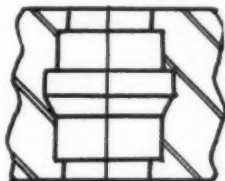


THIS is another Max-WELL-Made tool. It is designed especially to fit any and all jig and fixture setups, and is available in three sizes which have working range of from $\frac{1}{2}$ to 2-3/16 inches. Tools operate into standard bushings and can be used on any automatic or manual spindle.

THERE is a Maxwell Recessing Tool for your job whether you do



**the work with a
DRILL PRESS, RADIAL
DRILL, TURRET,
CHUCKER,
AUTOMATIC OR
SPECIAL SPINDLES.**



INTERCHANGEABLE shanks and cutters provide this reasonably priced tool with wide range of application. Tools are available for immediate delivery. Write for full details or send your specifications and let our engineers recommend the proper Max-WELL-Made Recessing Tool.

THE MAXWELL COMPANY
9220 BROADWAY BEDFORD, OHIO

What Every Operator Knows

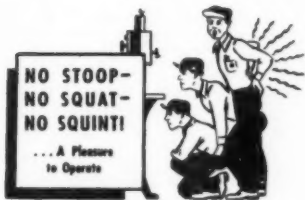
**OLIVER
OF
ADRIAN**



THE OLIVER ACE MAKES CUTTER GRINDING EASY

Accuracy in tool sharpening helps production all along the line. Make your toolroom production-wise by installing an Oliver Ace Cutter Grinder, choice of operators everywhere. Oliver's design eliminates grinding worries by keeping the work in full view of the operator at all times. Setups are quick and easy. Results show savings in time plus greater accuracy, less operator fatigue.

The Ace is available in two models: Standard and Heavy Duty (shown) for Tungsten-Carbide and high speed cutters. You will be surprised at the moderate cost.



IMPROVE YOUR TOOLROOM
IT'S THE BACKBONE
OF PRODUCTION



SEND FOR THE ACE CATALOG

AUTOMATIC DRILL GRINDERS
TOOL & CUTTER GRINDERS—DRILL
POINT THINNERS—TEMPLATE
TOOL GRINDERS—FACE MILL
GRINDERS—DIEMAKING MACHINES

**OLIVER
INSTRUMENT
COMPANY**

1408 E. Maumee St
Adrian, Michigan



Depend on
CULLMAN!

OVER 70,000 SPROCKETS IN STOCK

It is rare when the almost endless types of Cullman sprockets in stock fail to immediately meet your transmission requirements. But if it **SHOULD** happen, Cullman's exclusive methods and specialized equipment will quickly produce specials for practically every sprocket need no matter how complicated.

Cullman's long years of specialized experience and fast, low-cost, high-precision production methods assures the best possible source of supply for standard or replacement sprockets.

CULLMAN WHEEL COMPANY

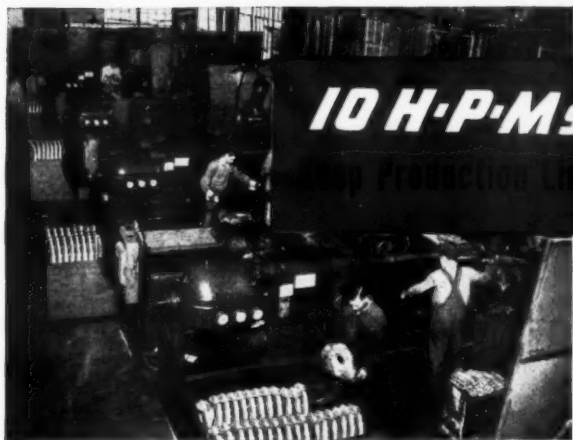
1350 West Altgeld St., Chicago 14, Ill.

Get Helpful Information

A particularly valuable Cullman catalog on sprockets and chains carried in stock, as well as illustrations, engineering data and horsepower tables applicable to power transmission, is yours for the asking. Suggestions and costs gladly furnished without obligation, upon receipt of blueprints or sketches.



SPROCKETS • SPEED REDUCERS • CHAIN DRIVES • FLEXIBLE COUPLINGS



10 H-P-Ms

at Hoover
Production Lines Running

1 H-P-M die casting machines are the answer to production of intricate parts for Hoover electric cleaners as well as millions of parts that Hoover supplies to other manufacturers. Die castings permit greater freedom of design... better, more uniform, and lighter precision parts... and a decided savings due to high production output, lower material costs, fewer machining operations, less scrap.

2 H-P-M die casting machines are putting the "skids" under production costs in many companies where high priced material and labor are threatening profits. Why not take a tip from Hoover? Change to die castings. Let us show you how to make precision metal parts better... faster... cheaper with H-P-Ms. Two basic types of machines—(1) cold chamber, (2) submerged plunger, are available in a complete range of sizes. Call in a nearby H-P-M engineer to recommend the correct type and size for your job.

THE HYDRAULIC PRESS MFG. COMPANY

1046 MARION ROAD • MOUNT GILEAD, OHIO, U. S. A.
Branch Offices in New York, Cincinnati, Cleveland, Columbus,
Detroit, Pittsburgh, and Chicago. Representatives in other principal
cities. Export Dept.: 500 Fifth Ave., New York. Cable—"Hydraulic"



Die castings used in the
Hoover electric cleaner

Just off the press—an authoritative article describing modern die casting practice. Write for your free copy today!

The ACCENT'S on ACCURACY . . .

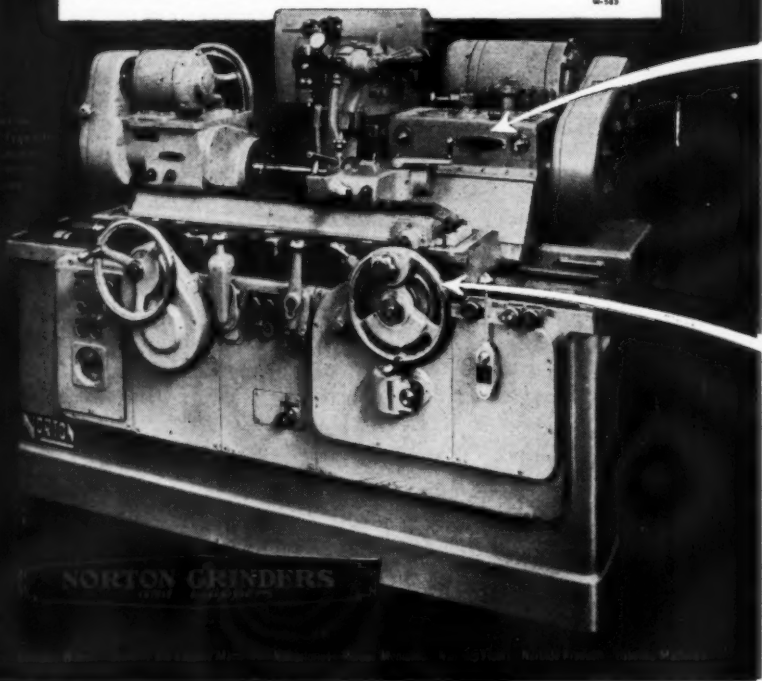
YES—the accent IS on accuracy in NORTON 6' and 10' Type CTU Cylindrical Grinding Machines—an enduring "make-money" accuracy that pays dividends in your grinding department—hour upon hour—day after day.

The basis of this accuracy is shown on the opposite page:

1. A rigid, wear-resistant spindle running in hard bronze, trouble-free sleeve bearings.
2. A responsive, easily operated feed mechanism that stands up under high production wear and tear—yet keeps delivering close limits on size.

The grinding wheel unit plus its method of feed represent the "heart" of a cylindrical grinder. In the new NORTON CTU line you get a NORTON-designed and NORTON-built "heart" that means low-cost grinding for you—low-cost accuracy and low-cost finish.

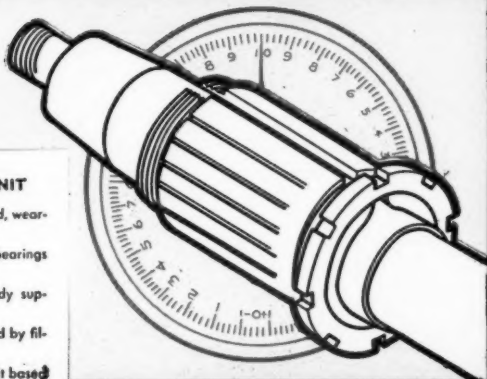
50-543



in NORTON Type CTU Grinders

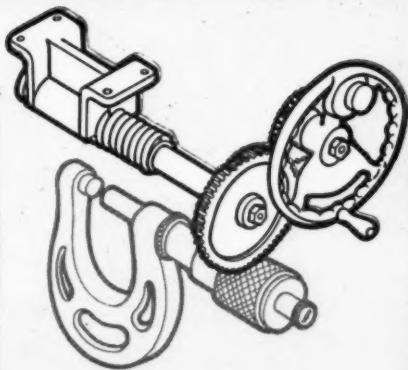
WHEEL SPINDLE UNIT

- Heavy spindle of toughened, wear-resistant alloy steel
- Extra-long, hard bronze bearings—easily adjustable
- Over 50% of spindle body supported in bearings
- Bearings force-feed flooded by filtered lubricant
- Design of wheel spindle unit based on time-tested principles
- Vibration-free performance insures fine finish and enduring accuracy



WHEEL FEED MECHANISM

- Wheel feed mechanism combines unique hydraulic and mechanical features for speed and accuracy
- Grinding feed taken by "revolving the feed screw"—micrometer-fine accuracy obtained by solid metal-to-metal contact
- Automatic wheel feed at table reversal—quickly adjustable over wide range
- NORTONIZER Automatic Work Sizing Device available. Gives excellent repetitive accuracy on close limit work—increases production—decreases or eliminates inspection time—reduces rejections.



LOWER DRILLING COSTS

... with
**SCULLY-JONES STYLE "B"
DRILL CHUCKS**

You can save 25% or more by replacing taper-shank with straight-shank drills and driving them with Scully-Jones Style "B" Drill Chucks. You replace worn-out drills only, as these chucks are built to outlast many drills.

Shop men like these simple, one-piece chucks, with no moving parts to get out of order; easy to insert or eject from any spindle, holder or attachment having a Morse Taper hole.

You get a positive drive when you use Scully-Jones Style "B" Drill Chucks as the milled flats on the shaft of the drill are engaged in the splined section of the chuck.

You reduce the number of rejects. Bore and shank of these chucks are ground concentric within .002", gauged at a distance equal to the projection of a standard drill from the chuck. This assures a true running tool.

You can use these chucks also for driving deburring tools, tapered pin reamers, straight shank countersinks, counterbores, chucking reamers, etc.



SAVE

the difference
between the cost of
your chucks and the
cost of your drills.

You can get
**IMMEDIATE
DELIVERY**

from our stock of all
popular sizes.

YOU GET LOW COST, FAST, ACCURATE PRODUCTION WITH OUR STANDARD AND SPECIAL TOOLS



Scully-Jones
AND COMPANY

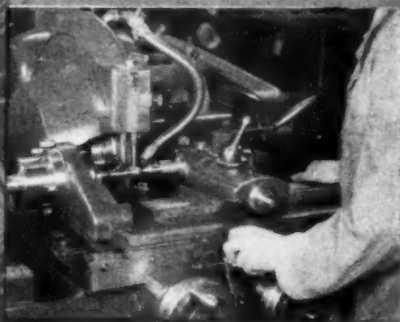
**1907 S. ROCKWELL STREET
CHICAGO 8, ILLINOIS**

Collets & stock pushers that help you get *better* work



Collets

Standard and special for all machines. Lathe collets a specialty.



Economy Stock Pusher

Midsection and nose bearings double the bearing surface, lessen required spring tension on work, function longer between adjustments and feed to the end of the stock.

OTHER SHEFFER PRODUCTS

• Master Collets

• Master pushers

• Collet tubes

• Pusher tubes and spools

• Finger holders

• *Sheffer*

HARDENS & GRINDS ALL
EXTERNAL THREADS ON
COLLETS, PUSHERS & TUBES
TO ASSURE PERFECT ALIGN-
MENT & LONGER LIFE

CONCENTRICITY

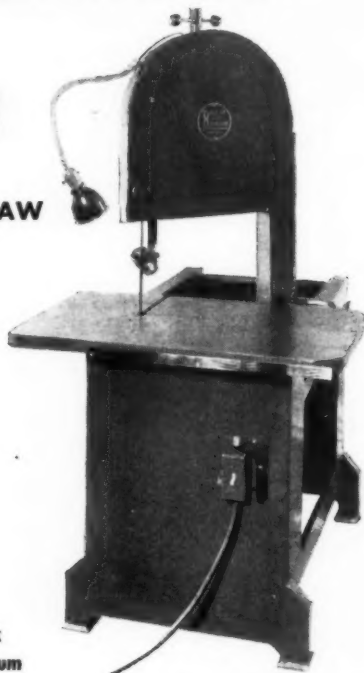
Sheffer Collet Co.
TRAVERSE CITY MICHIGAN

You Get Two Machines in One

with the

ROLL · IN

**ALL PURPOSE
METAL CUTTING BANDSAW**



1. CUT-OFF WORK

(Gravity Feed)

Flat Bar Stock

Round Stock

Angle Cuts

2. CONTOUR WORK

(Stationary)

Die Work

Model and Mold Work

Tool Room and Garage Work

Sheet Metal, Plastics, Aluminum

Write for Literature Today

3 SPEEDS • 6 BLADE WIDTHS

Table Type — Vertical Cut — Work Always in Front of Operator

National Distributors

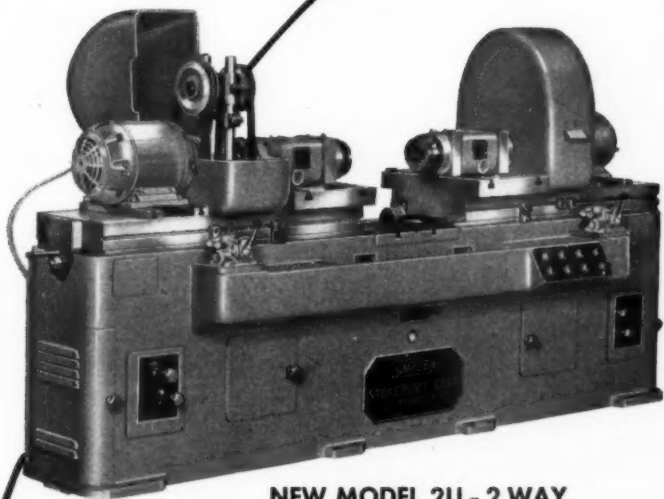
INDEX MACHINE Co.

545 N. MECHANIC STREET

JACKSON, MICHIGAN

SIMPLEX

*A New Concept
of
Precision Boring Machine Design*



NEW MODEL 2U - 2 WAY

- NEW SEALED — LUBRICATION PRECISION BORING HEADS
- NEW ONE PIECE BED CONSTRUCTION
- NEW INCREASED CAPACITY PLATEN DESIGN

PRECISION BORING MACHINES

SIMPLEX MACHINE TOOLS DIVISION

STOKERUNIT CORPORATION

4530 West Mitchell Street

MILWAUKEE, WISCONSIN

Precision Boring Machines, Planer Type Milling Machines, Special Machine Tools

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PRECISION CENTERED EYE BENDING

with

DI-ACRO BENDERS

DI-ACRO precision bending is accurate to .001" for duplicated parts. DI-ACRO Benders bend angle, channel, rod, tubing, wire, moulding, strip stock, etc. Machines are easily adjustable for simple, compound and reverse bends of varying radii.

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"DIE-LESS" DUPLICATING

showing many kinds of "DIE-LESS, DUPLICATING" produced with DI-ACRO Benders, Brakes and Shears.



Pronounced "DIE-ACK-RO"

O'NEIL-IRWIN mfg. co.

A Centered EYE in 1 Operation

The DI-ACRO Bender makes perfectly centered eyes from rod or strip stock at high rate of production. Both eye and centering bend are formed with one operation. Any size eye may be formed within capacity of bender and ductile limits of material.

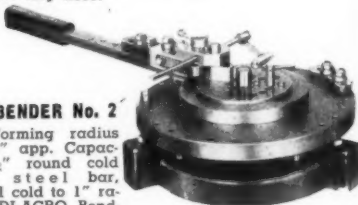
BENDER No. 1

Forming radius 2" app. Capacity 7/32" round cold rolled steel bar or equivalent. All DI-ACRO Benders have two-way action, right or left hand mounting and reversible forming nose.



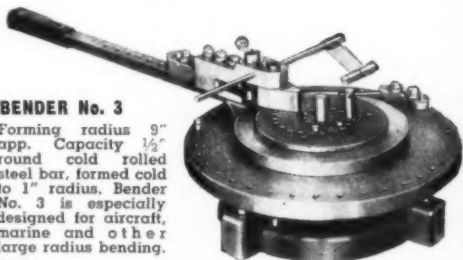
BENDER No. 2

Forming radius 9" app. Capacity 1/2" round cold rolled steel bar, formed cold to 1" radius. DI-ACRO Benders form bus bar and other strip stock both flat and edge-wise.



BENDER No. 3

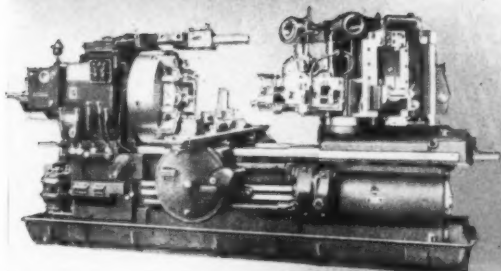
Forming radius 9" app. Capacity 1/2" round cold rolled steel bar, formed cold to 1" radius. Bender No. 3 is especially designed for aircraft, marine and other large radius bending.



314 Eighth Avenue
Lake City,
Minnesota

8-DT

AUTOMATIC TURRET LATHE



If you need greater capacity and more production than your present turret lathes can give, you will want to get full information on the P & J 8 DT Automatic Turret Lathe. Here is a unit with **POWER . . . extreme rigidity . . . 4 automatic changes of spindle speed . . . 3 selective automatic changes of feed . . . automatic binding of the turret following index . . . direct cross slide action . . . electro pneumatic clutch operation . . . PLUS a constant motor driven high speed motion to the cross**

slide and turret slide . . . 20 changes of speed between 7 and 160 rpm . . . and other features which make the 8 DT a top producer wherever it is installed. Write today for your copy of our bulletin which has complete data. No obligation.

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with
*Nuplaflex
Tips*



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- INTERCHANGEABLE
- FOUR HARDNESSES
- FIVE SIZES
- THIRTEEN WEIGHTS



Nupla hammers, with replaceable and interchangeable tips are the only "All Industry" hammers designed to fill all soft-face hammer needs.

Nuplaflex tips are made in three hardnesses and with the Nuplan (nylon) tip, a complete range of four hardnesses are available for all operations, including dual purpose combinations.

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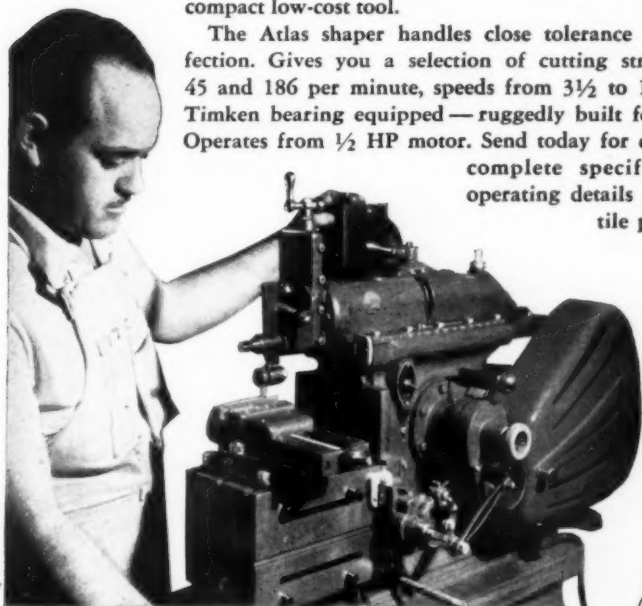
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"Match the machine to the job" is an idea that is tremendously helpful in tool room and shop . . . and especially valuable in shaping operations. Most of them are within the 7" stroke of the Atlas shaper. You can save considerable on set-up time, machine hour and power costs with this compact low-cost tool.

The Atlas shaper handles close tolerance work to perfection. Gives you a selection of cutting strokes between 45 and 186 per minute, speeds from $3\frac{1}{2}$ to 116 fpm. It is Timken bearing equipped — ruggedly built for heavy cuts. Operates from $\frac{1}{2}$ HP motor. Send today for catalog giving

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ATLAS PRESS COMPANY.

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210-TU



207-S



202

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- Friction-relieving off-sets in handles and links.
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New portable and plunger clamps are coming—to meet your various work-holding needs. Write for illustrated catalog and name of stocking representative in your area.

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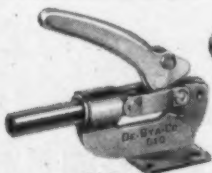
240



110-C



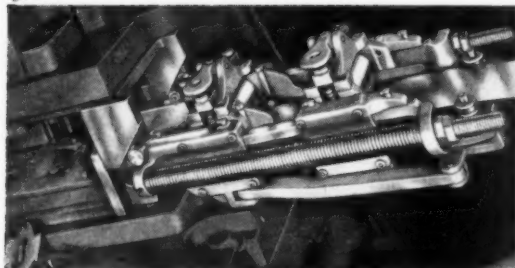
464



610

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*Reduce Punch
Press Operator Time
UP TO 90%*



FEEDS ANY
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PAPER
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RUBBER
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The AUTOMATIC FEED FOR *any* PRESS

If you're NOT using Dickerman DIE FEEDS you're NOT making the PROFITS you should be. Increases of up to 300% in Production are not uncommon when plants are modernized

the Dickerman way. Use them on your present presses . . . avoid costly jams and crackups. Don't follow competitors . . . lead them.

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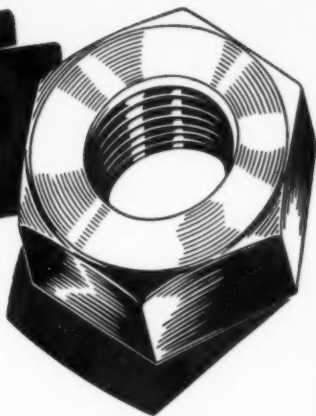
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**HERE'S
HOW...**



HY-PRO ENGINEERING
increased production from
1,000 pieces per tap to 12,000 pieces per tap

PART: Check nut for air-conditioning fan blade.

PROBLEM: Stringy consistency of 1020 steel caused the 3 and 4 flute taps to pick up and seize often breaking the tap on the 1st or 2nd piece. Production never exceeded 1,000 pieces per tap. Did the Hy-Pro Sales Engineer think it possible to design a tap that would increase output per tap?

HY-PRO SOLUTION: Samples sent to the Hy-Pro Engineering Department were studied and tested. They suggested using a two flute spiral point tap with a special Hy-Pro finish. Manufacturer reports average production per tap now exceeds 12,000 pieces.

Above is a typical example of how the Hy-Pro Sales Engineer can help increase threaded-hole production. His expert engineering counsel backed by the most up-to-date tap production methods combine to solve tapping problems rapidly and profitably.

Let Hy-Pro solve your tapping problem — call a Hy-Pro Sales Engineer today.

Order from your Distributor

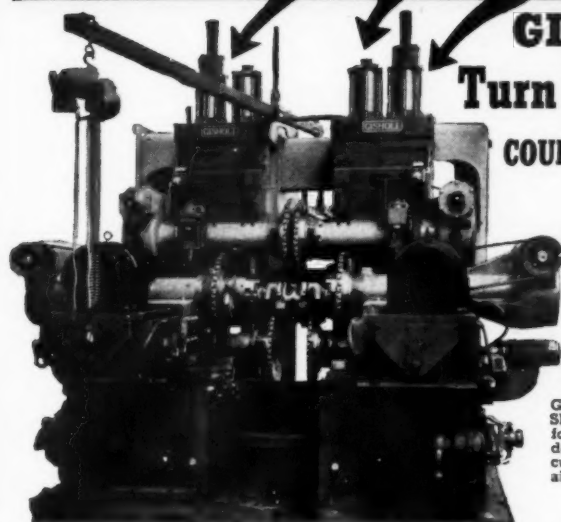


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NEW BEDFORD, MASSACHUSETTS

A SUBSIDIARY OF CONTINENTAL SCREW COMPANY

LAW of GRAVITY Suspended . . .



GISHOLT
Turn Mill Slides

COUNTER-BALANCED

by

NOPAK
AIR
CYLINDERS

GISHOLT Model TMP-6 Crank-Shaft Turn Mill equipped with four 10" NOPAK Air Cylinders which suspend heavy cutter-slides in a column of air.

The Crank-Shaft Turn Mill pictured has two vertical columns, each of which carries 2 cutter slides, one upper, and one lower.

Each slide weighs about 550 pounds and has its own counter-balancing 10" NOPAK Air Cylinder located at the top of the vertical column. There is a constant and continuous air pressure on these cylinders, and no valves of any kind are used. As these slides are counter-balanced by air, they have no gravitational weight. Their feed-movement is controlled by hydraulic cylinders.

This unique application is one of several which Gisholt has found for NOPAK Cylinders or Valves in building its line of Machine Tools. You can use them to advantage in your product . . . or in your plant.

GALLAND-HENNING MFG. CO., 2754 South 31st St., Milwaukee 7, Wisconsin

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APPLICATION MANUAL**

**REPRESENTATIVES
IN PRINCIPAL CITIES**

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VALVES AND CYLINDERS
DESIGNED for AIR and HYDRAULIC SERVICE

ANOTHER *NEW* SHEARCUTTER TOOL
The SHEARCUTTER
BLIND HOLE ROTARY BROACH

PRODUCES PERFECT HOLES

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CT **3. Perfect Finishes** PERFECT HOLES PERFECT HOLES

PERF 4. Accurate to 1/10,000

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HOLE PERFECT HOLES • PERFECT HOLES •

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ES • PERFECT HOLES • PERFECT HOLES • PERFECT HOLES • PERFECT HOLES • PERFECT HOLES

7. Low cost per hole

PERFECT HOLES • PERFECT • PERFECT

blind holes within
1/8" of bottom

PERFECT HOLES • PERFECT HOLES • PERFECT

any power-fed

machine tool

10. For use on any

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When you want Perfect Holes, consult

When you want Perfect Holes, consult

SHEARCUT TOOL COMPANY

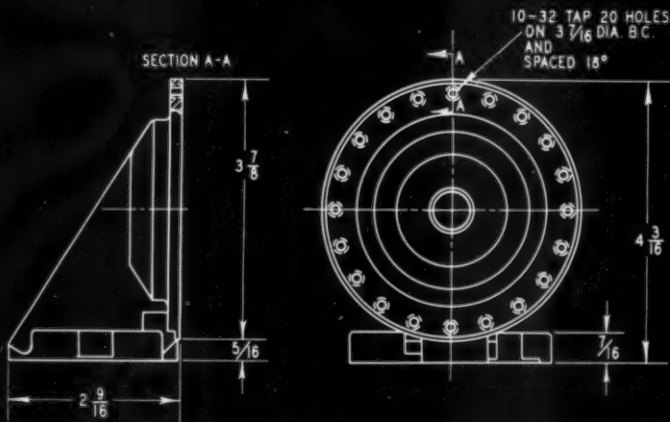
Box 746, Dept. MT-98 • • • Reseda, California

NOW-NEW LOWER PRICES ON SHEARCUTTER ROTARY BROACHES

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PRODUCTION INCREASED 100% over Previous Method

with NATCO High Speed Sensitive Drilling and Tapping Machine



Part—Die Cast Diaphragm Cover

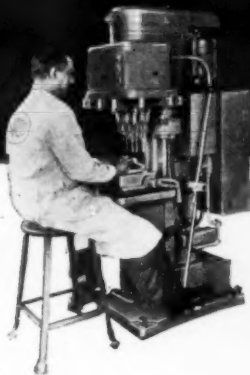
Operations—Tap Ten 10-32 Holes

Index

Tap Ten 10-32 Holes

Production—Approximately 300 Parts Per Hour

NATCO A33 Multi-Spindle Machines are built specifically to help you obtain more economical high speed, light sensitive drilling and tapping operations in your plant. They make possible remarkably high production and low hole cost in a wide range of small and medium sized work. Whether your production involves drilling and tapping operations in cast iron, in steel, in aluminum, in plastics or in wood, NATCO welcomes your inquiry and suggests that you send prints wherever possible. Write today!



NATCO DRILLING BORING, TAPPING AND FACING MACHINES



NATIONAL AUTOMATIC TOOL COMPANY, INC., Richmond, Ind., U. S. A.

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Detroit • 1807 Elmwood Ave., Buffalo • 2902 Commerce Bldg., New York City

Call a Natco Field Engineer

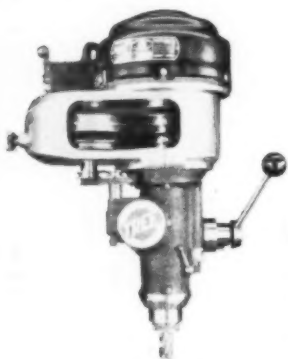
CUT TAPER-HOLE COSTS

With the TREE Taper-Boring Tool

Here's a revolutionary boring tool for the milling machine, jig borer and boring bar—that not only bores taper holes, but can also be used for facing, straight boring and outside turning.

Expensive, non-productive set-up time can be cut from hours to a few minutes by using a TREE Taper-Boring tool because it eliminates the need for special taper tools and time-consuming, elaborate set-ups.

Ideal for boring metal patterns, die cast dies, rubber or plastic molds, drop forge dies, etc. Speedy and economical to use.



TREE UNIVERSAL MILLING HEAD ATTACHMENT...

All Angle Milling, Drilling, & Boring.
Compact Design. $\frac{3}{4}$ " Collet Capacity.
4" Quill Travel. Power Feed Eight Speeds—
140-3500 RPM or 210-5200 RPM. Hardened & Ground
Spindle & Quill. Enclosed Micrometer. Depth Stop.

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LEADERS

in Quality

CONWAY CLUTCHES

Patented in U.S.A. and Canada

Practically all models are now STANDARDIZED . . . with INTERCHANGEABLE PARTS so as to make for ECONOMICAL PRODUCTION, USE AND COST. Built of basic materials, precision designed and engineered. Many models, also in large bores. 1/3 to 300 hp

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Illustrated: Model 222G, gear tooth drive, triple plate mechanism

THE CONWAY CLUTCH co.
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*America's Greatest and
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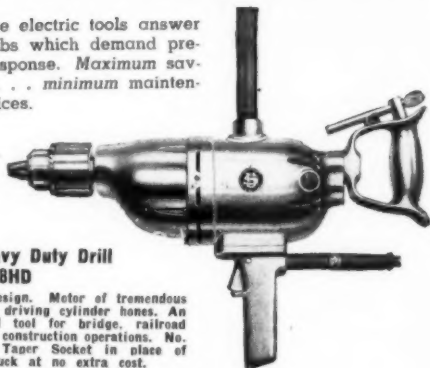
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When industry calls . . . these electric tools answer "here" for the innumerable jobs which demand precision-efficiency and instant response. Maximum savings in time, labor and cost . . . minimum maintenance and most economical prices.

**Drills
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Flexible shaft
machines**



**$\frac{5}{8}$ " Heavy Duty Drill
Model 58HD**

Rugged design. Motor of tremendous power for driving cylinder hones. An exceptional tool for bridge, railroad and major construction operations. No. 2 Morse Taper Socket in place of geared chuck at no extra cost.

100% anti-friction bearings throughout. Ball bearing on armature. Ball and needle-roller on chuck and intermediate spindle.

Also available in $\frac{3}{4}$ " and $\frac{7}{8}$ " heavy duty drills.

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Install Ross-In-Line for a Full-Flo Line!

THIS

NOT THIS



Full Pipeline Capacity

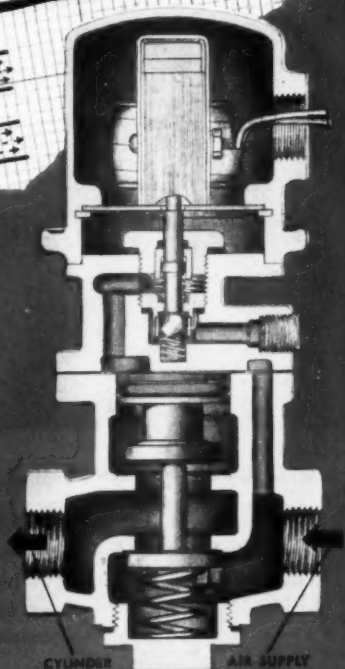
with lower initial and operation costs...

Yes, these new Ross-In-Line valves fill the bill—a direct way in every plant. Solve your "on-and-off" problems, instant shut-off for plant-wide systems—a single control line—or split second control of a single acting cylinder. These air-controlled valves handle pressures 1 to 125 p.s.i.—air, liquid, and gas. Do it better, too, yet at lower cost.

Here's Why...

- **FULL LINE CAPACITY**... Full Flo design provides full pipe size opening throughout valve. Eliminates "pinching" of line, reduces friction loss.
- **LOWER FIRST COST**... More capacity—therefore more efficiency—per dollar. Quick, easy, straight line installation. No mounting brackets.
- **LOWER OPERATING COST**... Only four moving parts, all non-corroding. Inspection without removing from line. Solenoid consumes only .2 amps. holding and 1.2 surge at 110 v. 60 cy. Interchangeable pilot section simplifies service, decreases inventory.

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Solenoid-Pilot Sections interchangeable on all 16 Ross-In-Line Bodies.

ROSS OPERATING VALVE CO.

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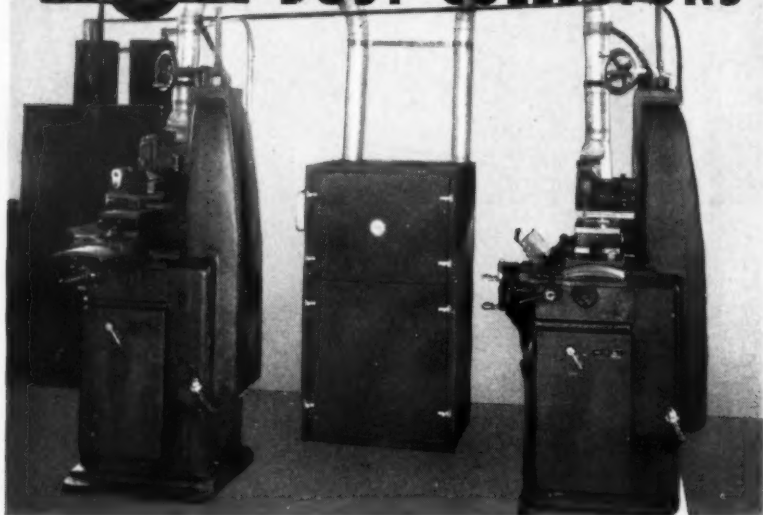
Detroit 3, Michigan

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AIR HORSEPOWER

TORIT DUST COLLECTORS



are doing a *neat job* on these surface grinders

Here is a neat, attractive and efficient dust collecting installation. The TORIT No. 81 Dust Collector does not interfere with the accessibility of either machine. A minimum of piping connects it directly to the grinding hoods. This is the type of set up that pays dividends in good working conditions and high quality output.



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TORIT MANUFACTURING CO.

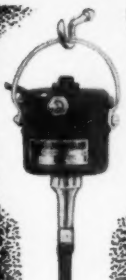
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St. Paul 2, Minn.

NEW FOREDOM Model #99 at an Amazing LOW PRICE

**FLEXIBLE SHAFT
MACHINE
with PENCIL-SIZE
HANDPIECE**

**\$15⁹⁵
COMPLETE
WITH
MOTOR**



**The ONE tool that Grinds, Polishes, Drills, Routs, Mills,
Saws, Slots, Cleans, Sands, Etches, Engraves, Carves . . .**

**For Your Production, Maintenance and
Tool Departments.**

Now, at this amazing low new price — not since pre-war days has it been equalled — you get a fine post-war Foredom Flexible Shaft Machine. You get extra power and longer motor life. You get a motor that is large enough and powerful enough to do the job — a motor that is not dwarfed to fit the hand. You get the right handpiece size for deft, sensitive fingertip control. With the FOREDOM you can get into those "hard-to-reach" places.

Why plod along with cumbersome old-fashioned tools when you can obtain maximum versatility with these new low priced Foredoms! The FOREDOM line includes other heavier-duty models affording a selection of 5 interchangeable handpiece types. Our new catalog No. B-199 gives you valuable information on shop use. Write for it at once.



**Order
Today!**

NEW FLEXIBLE SHAFT ATTACHMENT



Now you can convert your old bench motors, drill presses, and electric drills into Flexible Shaft Machines with FOREDOM'S new PRESTO-flex! Simply attach to your motor or drill press. Presto! a flexible shaft machine! Off again in a jiffy! Pencil-size handpiece gives you finger-tip control. Gets into tight places you can't reach with any other tool. Handy 35" overall length. And — only \$5.95 complete! Order NOW. If you order Presto-Flex for use on motor, specify motor shaft diameter and add 50c for motor coupling. (Available for $\frac{1}{4}$ ", $\frac{5}{16}$ " $\frac{3}{8}$ ", and $\frac{1}{2}$ " shafts).

**Only
\$5⁹⁵**

**FOREDOM ELECTRIC CO., Dept. B-199,
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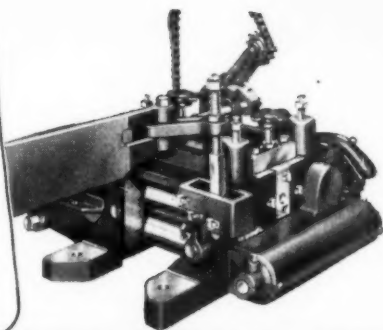
Please send us your new free catalog showing the different uses of FOREDOM Flexible Shaft Machines.

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Address.....

City & Zone..... State.....

**Assures Fast
Safe-Accurate
Feeding of
Coiled Strip Stock**



WITTEK *Automatic* **ROLL FEEDS AND REEL STANDS**

For All Types of Punch Presses

Wittek *Automatic* Roll Feeds provide maximum efficiency in the high speed automatic feeding of all types of coiled strip stock to punch presses. Highly flexible in function and application, they are capable of feeding lengths up to 24" per stroke of the press and will handle various stock thicknesses in widths up to the maximum width of the rollers.

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WITTEK Manufacturing Co.

4305 W. 24th Place, Chicago 23, Illinois

Automatic
ROLL FEEDS
and
REEL STANDS



REPORT NO. 9

Here's Proof!

MACHINE: W & S Turret Lathe		TOOL: Tantung Cut-Off Blade		OPERATION: Cut off end of pressed boiler plate gas cylinder cap—1/4" wall thickness.	
PERFORMANCE:		TANTUNG		H.S.S.	
SFM SPEED:	250	SFM SPEED:	150		
Feed per Rev:	.016	Feed per Rev:	.016		
Depth of Cut:	1 3" O.D. to 2 3/4" I.D.	Depth of Cut:	1 3" O.D. to 2 3/4" I.D.		
Pcs per Grind:	200	Pcs per Grind:	100		
Remarks:		High speed steel tools burned. Tantung practically doubled speed, in addition to doubling pieces per grind.			

MACHINE: Gridley Acme Automatic		TOOL: Tantung Cut-Off Blade		OPERATION: Cut off lengths of 1340 Steel Bar Stock	
PERFORMANCE:		TANTUNG		H.S.S.	
SFM SPEED:	150	SFM SPEED:	150		
Feed per Rev:	.008	Feed per Rev:	.008		
Depth of Cut:	3/4" to center	Depth of Cut:	3/4" to center		
Pcs per Grind:	5000	Pcs per Grind:	1000		
Remarks:		With identical speeds and feeds Tantung outperforms H.S.S. 5 to 1. Recommendation made to check all jobs for improved performances with Tantung.			

THAT YOU GET RESULTS WITH TANTUNG®

Actual industrial reports prove that Tantung, the tough, shock-resistant, non-ferrous cast alloy performs at far greater speeds and feeds than high speed steels. In addition to permitting heavier cuts, heavier feeds, and producing more pieces per grind, Tantung is considered an excellent finishing tool and on most materials the finishing cut can be taken at least one speed faster than the roughing cut.

For courteous, experienced help in applying Tantung to your machining problems, write or call your nearest V-R Field Engineer today.



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WAUKEGAN
ILLINOIS

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15 hours
PER MONTH SAVED
ON GRINDING OPERATIONS
with
BARNESDRILL
AUTOMATIC
COOLANT SEPARATORS

EXAMPLE: HEALD 25A SURFACE GRINDER

- Machine shut downs for clean-out and maintenance are costly and hinder productive output.

On certain types of operations such as grinding, honing, shaving and shaping, the accumulation of fine sediment and swarf rapidly plugs coolant lines, seriously effects work finish and destroys coolant life. Machines must be cleaned frequently to keep them operating efficiently.

A **BARNESDRILL** No. 2 Automatic Coolant Separator, installed on a Heald 25A Surface Grinder, as shown, automatically removes circulating sludge and sediment. As a result, a constant supply of clean coolant is assured and 15 hours per month, previously required for maintenance, have been saved for regular machine output.

Check your requirements for maintenance and sludge removal. Separators are available with capacity from 5 to 100 gallons a minute. A **BARNESDRILL** Automatic Coolant Separator will improve machine performance and efficiency on similar operations in your production.

Write for Bulletin B151A

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852 CHESTNUT STREET ROCKFORD, ILLINOIS U.S.A.

2

"LOGAN" SOLENOID AIR VALVES

Control

4 LOGAN AIR CYLINDERS
for Clamping and
Unclamping the work

1 LOGAN AIR CYLINDER
for Starting and Reversing
the Hydraulic Table Feed

IN FULL AUTOMATIC CYCLE ON SPECIAL MACHINE

All movements of this special machine are automatically controlled in sequence by means of two Logan solenoid air valves of the bleeder-operated type. The cycle is as follows:

- 1 The work moves through a channel until it strikes the end stop and trips an electric control switch.
- 2 One Logan electric solenoid operated air valve activates four Logan air cylinders simultaneously to clamp the work. At the end of the clamping movement, a cam trips an electric limit switch (center photo).
- 3 A second Logan electric solenoid operated air valve then activates the fifth Logan air cylinder (top photo), automatically starting the foot trips which control the hydraulic table feed.
- 4 The table moves upward, feeding the work to the cutters. Multiple wood boring operations are performed simultaneously on telegraph pole cross arms.
- 5 As the table feed movement is completed, another limit switch is tripped, and the second air valve reverses the table movement. This trips still another limit switch, operating the first air valve and releasing the clamping fixture so the workpiece can be unloaded.

APPLY THESE ADVANTAGES TO YOUR WORK

Get greater speed, accuracy and efficiency in your plant and on your products . . . use Logan Air Valves for manual or foot, remote, automatic, semi-automatic, interlocking or sequence control of cylinder movements. Call on Logan engineers for circuit recommendations. No obligation.



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Photos courtesy of B. M. Roel Co., York, Pa.



THE CENTER BLOCK

Is a Vital Part in any Universal Joint

. . . Says Tommy Universal

Yes — WE ALWAYS KNEW the center block was the "heart of a Universal Joint" and that bearing-pin holes in the block must intersect accurately in the exact center — that bearing faces must be parallel, hardened, and precision ground to insure smooth, trouble-free, long-lived operation.

BUT — WE NOW KNOW from recent extensive laboratory tests that two parallel lubrication grooves on each of the four (4) bearing surfaces of the center block reduce heat.

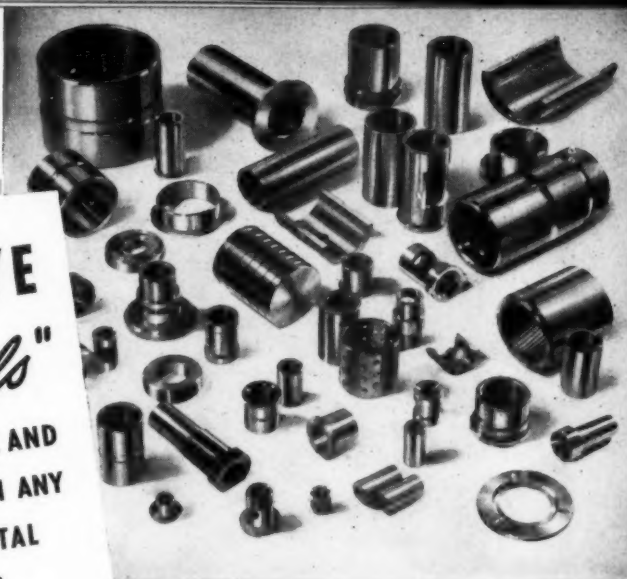
DO YOU KNOW you can now buy Curtis Universal Joints in sizes from 1¼" up for 3½" or larger shafts — equipped with this new LO-FRICTION center block **at no extra cost?**

Be sure to specify Curtis Universal Joints — available from stock in 14 standard sizes, either single or double, for heavy duty installations — Curtis "Ball-Type" Universal Joints in 4 sizes for high speed light-duty or hand-operated installations.

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"Specials"
IN ANY I.D., O.D. AND
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Exactly to Your Blue-Print Requirement

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4TON
punch
press



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**SAVE UP TO 50%
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Index punch holders straight up with no pounding, no prying, no damage to the set . . . no lost time.

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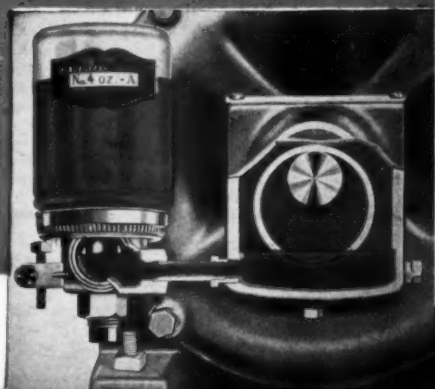
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CLEVELAND Model 400 Die Casting Machine
outshines previous stamping operations

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The Standard-Thomson Corp., Dayton, Ohio, prime contract supplier of spotlights for a leading automobile manufacturer, continued investigating the possibility of *die casting* these head sections, although other lamp manufacturers considered it impractical. Die cast surfaces couldn't take the smooth, high-chrome finish required for automotive accessories, they said.

But take a look at the zinc head section castings now

flowing from Standard-Thomson's new Model 400 Cleveland. Fully automatic timed operation averages *144 perfect shots per hour!* Cleveland's "squeeze to the shot" produces *hardware finish* castings which require only buffing before plating. Machining costs, metal costs and die costs are down—production is high.

If you're considering new die casting machinery—or *changing to die castings*—profit from the experience of others and consider *Cleveland's first!* Let a Cleveland engineer show you the advantages. For complete machine specifications, write now for bulletins.

Remember *Cleveland's Cut Costs*

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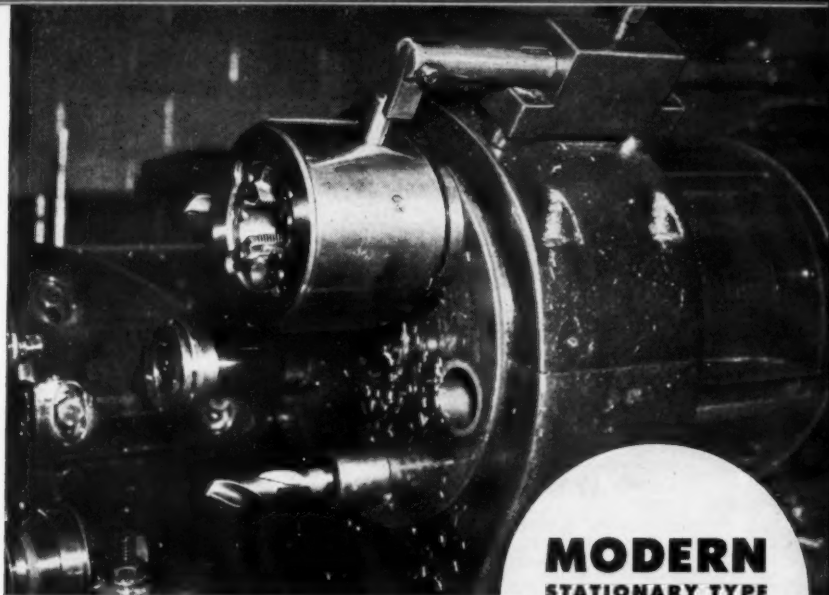
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Here a Modern Stationary Type Self-Opening Die Head is shown in operation on a Cleveland Automatic. The die head's floating shank compensates for any difference between the lead of the cam of the machine and the thread to be cut.

MODERN STATIONARY TYPE SELF-OPENING DIE HEADS

Modern Precision Tools
Include

STATIONARY SELF-OPENING
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The line of standard Modern Stationary Type Self-Opening Die Heads thread diameters from $\frac{1}{8}$ " to 7" in standard heads and up to 14" in special heads, accurately, fast and economically. They are adapted to practically every thread cutting operation within their capacity. Designed for use in hand screw machines, turret lathes and other machines where the die head is used in a stationary position and the work revolves.

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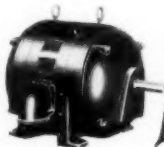


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 $\frac{1}{2}$ and $\frac{3}{4}$ hp.
Polyphase
 $\frac{1}{2}$ to 75 hp.

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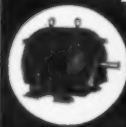
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Easy handling. Tool weighs only 1 lb.-10 oz.

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Riveting with Chicago Automatic Rivet-Setters is a fast, inexpensive way to fasten metal to metal, wood to wood, leather to leather, fabric to fabric, plastic to plastic, or any combination of these. Chicago Rivet engineers have the experience of 26 years to help you with your hard fastening problems.

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Model 121

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Immediate shipments from stock of U·S·S Carillo Steels

— manufactured to a
**Guaranteed Minimum
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And when you place an order with us for U·S·S Carillo Steel you get an additional metallurgical service: A *Heat Treatment Guide* which contains complete and specific information about the steel you receive is supplied with each individual shipment. This guide gives you specific data on the composition, potential physical properties and fabrication of the steel to help you obtain the maximum performance from the steel we furnish on your order.

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UNITED STATES STEEL

Reaming

accurate, straight, round holes

With
**BARBER-COLMAN
CARBIDE TIPPED
REAMERS**

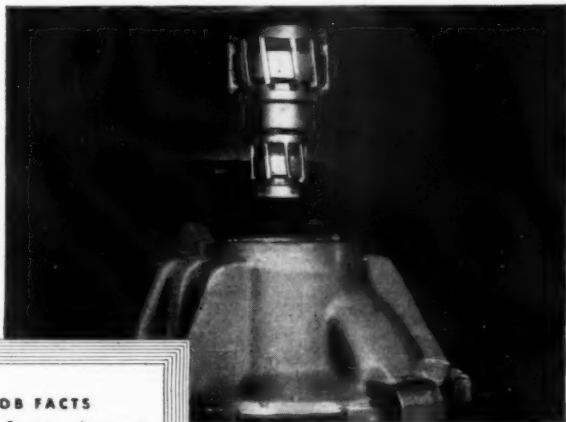
Sand pockets in these motor truck differential housings caused early dulling of high-speed steel reamers and unsatisfactory finish on the reamed surfaces. Barber-Colman Carbide-Tipped Inserted Blade Reamers were tried, and tool life jumped from 150 to 3000 pieces per sharpening.

These reamers are designed with irregular blade spacing, and special cutting and relief clearances to provide smooth cutting action. Two holes are reamed straight and round, in alignment. Diameters are held within .001". The ability of the carbide to resist wear in this abrasive material greatly improves the finish, and the irregularly spaced blade design has eliminated the tendency of the reamer to pattern and form welts.

Consult Barber-Colman Reamer Engineers for application of Carbide-Tipped tools to your reaming problems.

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GENERAL OFFICES AND PLANT 131 LOOMIS ST., ROCKFORD, ILLINOIS, U.S.A.



JOB FACTS

Operation — Ream two diameters in alignment

Material — Malleable iron Casting

Tool Life — 3000-4000 castings per sharpening

Tolerance — Diameters finished within .001"

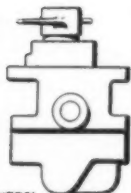


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AND FAST TABLE TRAVEL

**125 f. p. m. longitudinal table speed
means fast micro-accuracy* production
with GRAND RAPIDS GRINDERS**



Fast longitudinal table travel — *the fastest available in any grinder* — is an important reason why you find Grand Rapids Grinders in so many leading plants. Such rapid operation makes possible high-speed, accurate production . . . of small mass-produced razor parts, as well as massive locomotive sub-assemblies.

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*Accuracy within 0.00025 limits

To serve you — Your inquiry concerning your specific grinding needs will receive prompt attention.

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the P13 PANTOGRAPH for 3-Dimensional Light Milling and Engraving



**GEORGE
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1400 BROAD ST. CHICAGO, ILL., U.S.A.



This revolutionary machine features the new and exclusive *RATIOBAR Tracer Control—the first basic design improvement in pantograph construction since the first pantograph was built.

Manufacturers of small intricate dies, molds, hubs, stamps and other related products placed firm orders sufficient to take all of the first production run after inspecting the pilot model—real proof of the value built into the P13.

What is *RATIOBAR tracer Control?

*RATIOBAR Tracer Control is the name for the newly developed principle of control, found only on the Gorton P13. It does three important things: permanently aligns the pivot center, cutter spindle and tracing style in an absolute straight line without guessing or innumerable adjustments; enables the operator to set reduction ratios with just one slider block; it provides rigid support for all pantograph linkages. No other manufacturer offers these advantages in a pantograph.

Easier operation and better balance are also assured with the *RATIOBAR because linkages move toward the pivot center as the tracer moves out and away from it. For detailed information, use coupon below.

OTHER MODELS FOR OTHER WORK

The new Gorton P13 is just one of a family of cost-cutting, precision pantographs. Your requirements may call for the 3-L—largest 3-Dimensional Pantograph available today, the 3-U or 3-Z for light or medium milling and engraving in 2 dimensions, or you may require special adaptations or tooling. Our Engineering Service is ready to serve you without obligation.



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*Profitless grinding proposal becomes
valuable business through use of*

METALITE* BELTS

GET THE COMPLETE SERIES

Our booklet "Production Talks — Backstands" gives you a whole series of similar case histories with convincing facts and figures. Write for your copy today.



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Even with his sharpest pencil this cutlery manufacturer could not figure any profit to him, using set-up wheels, in a proposed contract including rough and finish grinding sheath knives. Then he considered the belt backstand method — and the proposition immediately became good business.

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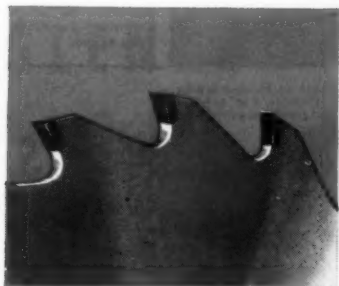


**THE BELT METHOD IS THE BETTER METHOD
... AND THE BETTER BELT IS METALITE**



BARRELLED JOB:

A Carbide-Tipped SAW THAT CUTS PLASTICS AND CUTS COSTS



There must be something to the engineering of this saw when one user writes: "More than 80,000 feet of plastic sheets have been cut and it looks good for as much again." Manufacturing fine cutting tools for well over half a century has given us the know-how to save you money on your cutting problems.

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...SPECIAL SKILLS



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The SUPER METHOD

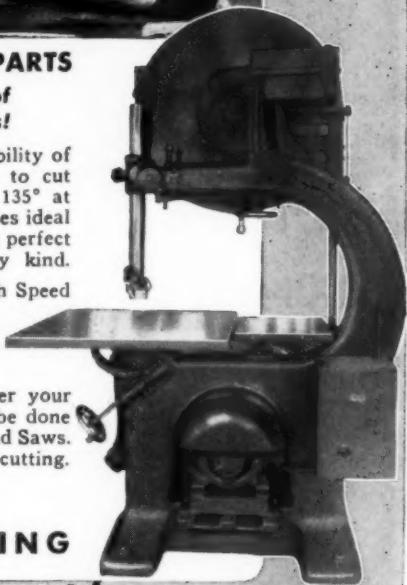


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*and performing a host of
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TYPE "300"

A POWERFUL, rugged, inexpensive Press Brake, designed and built to the standards of Chicago Steel Forming Presses.

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World's largest manufacturer of Steel Hand Bending, Power Bending and Power Press Brakes.

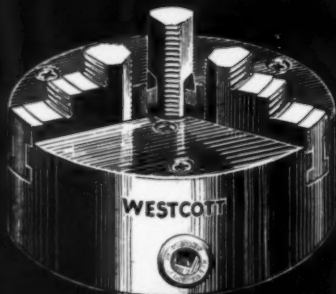
A Small Steel Welded Construction Press Brake a brute for punishment and a prodigious worker for the Sheet Metal Plant—

—3 sizes—capacities 10 gage, 4 ft. long; 12 gage, 5 ft. long; 14 gage, .6 ft. long. Powered by 1½ h. p. motor.

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Complete line includes every shape and size.

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London, N.Y.
Special Steels

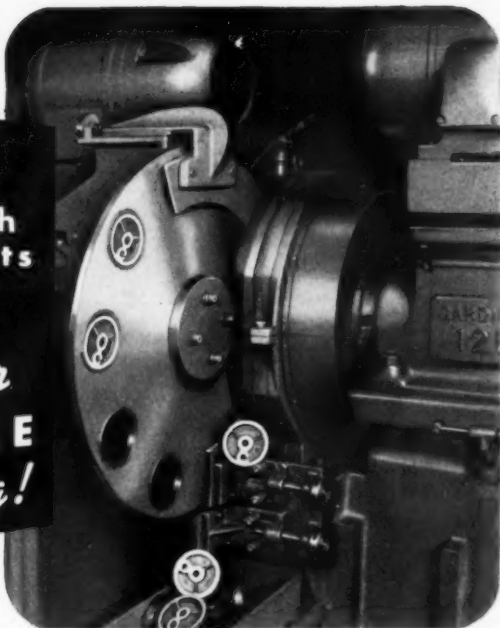
**SIMONDS
STEEL TIPS**

Westford, Can.
Simonds Products for Canada

SIMONDS ABRASIVE COMPANY, PHILADELPHIA 37, PA. • DISTRIBUTORS IN ALL PRINCIPAL CITIES

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

Offset
Your High
Labor Costs
with
Gardner
DOUBLE
Grinding!



WORK DATA

Part *Gear Blanks*
Material *Cast Iron*
Operation
Grind Two Parallel Sides
Tolerances *.001 to .002 Parallel*
.002 to .003 Uniform
Stock Removal
Roughing - .030 to .040";
Finishing - .010 to .020"
Maximum Overall
Production *Roughing - 6 to 8*
Pieces per minute; Finishing -
8 to 10 pieces per minute
Feed *Hand Load*
Ejector Unloading
Machine *No. 125-26*
Gardner Double Grinder

SEMI-AUTOMATIC in operation, GARDNER Double GRINDERS cut down labor costs on many kinds of parallel-surface parts by precision-grinding TWO sides with ONE pass through the machine.

In the example above, gear blanks are hand loaded into a rotary attachment, which carries them between two opposed 26" grinding wheels. They are unloaded by an automatic ejector. Two cuts or passes are required.

For information that will help you to offset your high labor costs, and speed up your parallel-surfacing operations —

Use Modern
GARDNER
WIRE LOFT
Abrasive
on YOUR
Disc Grinders!



**GARDNER - GRIND
YOUR Flat SURFACES**

Write for GARDNER *Double* GRINDING Bulletin!

GARDNER MACHINE COMPANY

436 East Gardner Street • • • • • Beloit, Wisconsin, U.S.A.



A Dumore* keeps your costs Well in Hand

often saving as much as
twice its cost every day

A tool that pays for itself twice-over *every* day is a wise investment, isn't it? That's the kind of savings Dumore Handgrinders make at the Wisconsin Axle Division of Timken-Detroit Axle.

J. P. Schommer, purchasing agent, says they use about 30 Dumore No. 10's in their plant — burring and finishing gears. Production on one job (formerly done with a slip-stone) was increased 200%! They save enough in three weeks on this job alone to pay for every Dumore they use!

You, too, can cut your costs with Dumore!

There are dozens of jobs in your shop for Dumore Handgrinders. And there's a Dumore that's right for each job! Choose the Dumore you need from the four different models at the left (a flexible shaft attachment fits the Duplex). Call your distributor today.

FREE Complete certified report on this Dumore job is yours for the asking!

Tear out this coupon and mail today!

The Dumore Company, Dept. J-27, Racine, Wis. **B-1**
Yes, I'm interested in cutting costs and doing a better job!

Check

- ☐ Send me your certified report of Dumore grinding at Wisconsin Axle Division, Timken-Detroit Axle, Oshkosh, Wisconsin.
☐ Send me your catalog.

Name.....
Company.....
Address.....
City..... State.....

*Trademark Reg. U. S. Pat. Off.

DUMORE

RACINE, WISCONSIN

Sold by leading industrial distributors
in all principal cities.

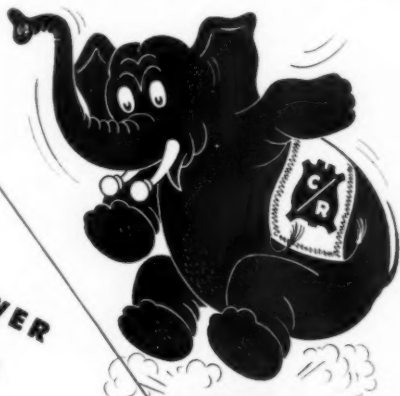
When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

RAWHIDE gives you *more* in soft hammers and mallets. And Chicago Rawhide gives you exceptional power and maximum protection. C/R hammers and mallets absorb shock, deliver powerful blows, protect finished surfaces and stand up under tough use. For hammers and mallets that never split, crumble or mushroom, always ask for *Chicago Rawhide*.



C/R Hammers have malleable iron heads with replaceable coiled rawhide faces.

POWER
PROTECTION
LONG LIFE
DURABILITY
TOUGHNESS
BALANCE



CHICAGO *Rawhide* **MFG.CO.**

1321 ELSTON AVENUE

CHICAGO 22, ILLINOIS

Other C/R maintenance products are: round, flat, twist belting; belt pins and lacings; gears, pinions, gear blanks; aprons, hand leathers; hydraulic packings.

POPE



GRINDER SPINDLES AT A GLANCE



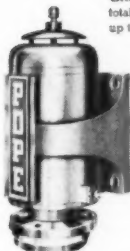
P-221 Pope Sealed Package Spindle for 6" x 18" Surface Grinders, with a full 1 HP, 3450 RPM totally enclosed motor; for use with grinding wheels up to 8" O. D., 1 1/2" face, 1 1/4" hole.



P-1004 Pope Direct Motorized Tool Grinder Spindle with 1 HP, 3450 RPM totally enclosed motor; for grinding wheels up to 8" O. D., 1 1/2" face, 1 1/4" hole.



P-2460 Pope Heavy Duty Vee Belt Driven Cartridge Type Spindle in mounting bracket, for grinding wheels up to 4" O. D. at 6000 RPM, 2" face with 1" hole.



P-2500 Pope Heavy Duty Motorized Spindles in a variety of sizes from 1/2 HP to 20 HP and from 900 to 3600 RPM.



P-600 Pope Heavy Duty Vee Belt Driven Grinding Machine Wheel Head Spindle; for grinding wheels up to 28" O. D., 1 1/2" face, 8" hole at 750 RPM. Maximum speed 4000 RPM.

Here is a representative showing of POPE Precision Grinding Spindles. Others are available in a great variety of sizes and styles. Each assures:

1. Constant Production of Uniformly Good Finished Surfaces.
2. Cool Operation At High Speeds Over Long Periods.
3. Sealed Lubrication Performance — no oiling or greasing, nothing to renew, replace or adjust throughout the entire life of the bearings.

NO. 52

POPE

MADE IN U.S.A.

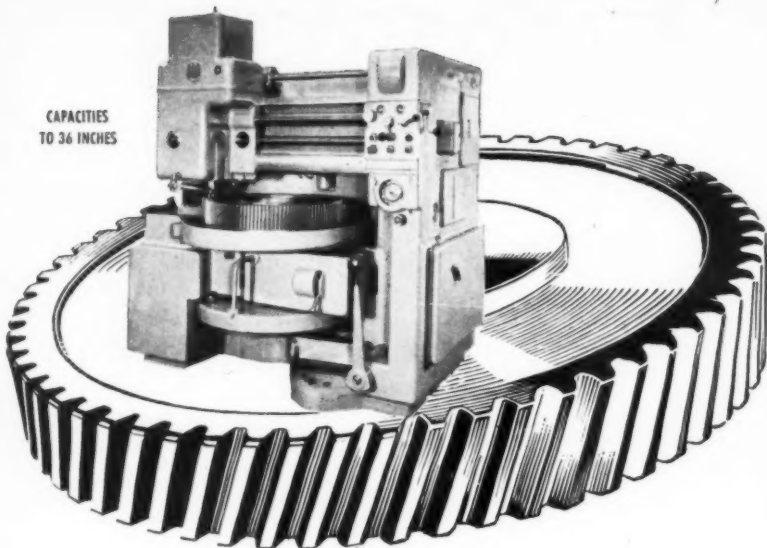
POPE MACHINERY CORPORATION

ESTABLISHED 1920

261 RIVER STREET • HAVERHILL, MASSACHUSETTS
BUILDERS OF PRECISION SPINDLES

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

CAPACITIES
TO 36 INCHES



IN GEAR CUTTING

QUALITY COMES FIRST ... then LOW COST

Precision is a tradition with Fellows... that is why you are always certain of high-quality gears when they are generated on the Gear Shaper. Machines, such as the new 36-inch "All-Purpose" Gear Shaper, assure exact duplicating accuracy at the lowest possible cost per piece. Again, your Gear Shaper never asks for "Time off" for it can be used for such a wide variety of work. Bulletins are available on a complete line of Gear Shapers with capacities up to 100 inches.

Fellows

The Fellows Gear Shaper Co., Head Office and Export Dept., Springfield, Vermont. Branch Offices: 616 Fisher Building, Detroit 2; 640 West Town Office Building, Chicago 12; 7706 Empire State Building, New York 1.

THE SOLUTION TO YOUR MILLING PROBLEMS

SEND FOR THIS FREE
FOLDER ➔

LEARN HOW...

to increase your
production

to reduce your
milling costs

BEMIS & CALL

COMPANY

Springfield • Mass.



MAIL
COUPON
TODAY

BEMIS & CALL COMPANY, 190 Main Street, Springfield, Mass.

Send me free folder giving detailed information about the Milmaster
"that converts one machine into a tool shop."

COMPANY _____

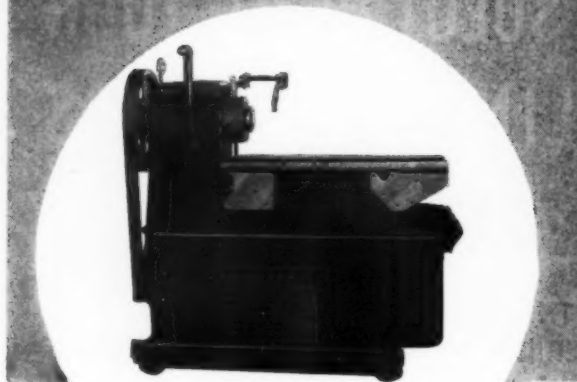
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ADDRESS _____

CITY _____ STATE _____

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NOW! *A Tailor-Made* PRODUCTION LATHE



SAVE MONEY ON A LATHE EXACTLY SUITED TO YOUR WORK WITH THE "BASIC UNIT + PARTS" PLAN

Your starting point is the "Basic Unit" of the heavy duty Minneapolis Production Lathe. To it you can add exactly the accessories needed for your specific production job,—any drive, any collet, mandrel or chuck, or any cross-slide, carriage or turret. By ordering only as many accessories as you need—you have a Lathe "tailor-made" for your present work at a minimum investment. Additional equipment can be added as needed, including specially designed jigs or attachments as desired.

WHAT IS YOUR PRODUCTION PROBLEM? Write us, send sample part or drawing—we'll be glad to quote you on a Minneapolis Lathe "tailor-made" for your work.

CENTRAL MACHINE WORKS CO

Machinery Designers and Manufacturers Since 1890

1269 Central Ave. N. E., Minneapolis 13, Minn.

ANY DRIVE

Single Speed
Slow Speed Chain
Four Speed
All Electric Multi-Speed

ANY COLLET

Plain Collet
Serrated Collet
Collet with Pads
Overhanging Collet
Expanding Mandril

Manual or Air Operation
of Collet or Mandril

Any CHUCK, air or hand
operated

ANY ACCESSORY



CROSS-SLIDE: Hand
Screw feed



CROSS-SLIDE: Rack and
pinion feed



CARRIAGE: With manual
or power feed, 3 lengths
to 18"



TURRET: 6 station flat
type, with hand or power
feed



**PICK THESE
BLADES**

JG-129

for LONGER CUTTING LIFE

For most economical production metal-sawing, pick the long-life **GRIFFIN SPECIAL ALLOY**. Molybdenum high speed steel. Machine and hand frame sizes.

To cut stainless, chrome, nickel and all other tough alloys, pick the **GRIFFIN HIGH SPEED STEEL**. 18-4-1 tungsten high speed steel. Machine and hand frame size.

For any hand-frame use, pick the tough, all-purpose **NEW GRIFFIN**. Flexible as a soft-back, durable as an all-hard.

For hand-cutting thinnest sheet, tubing, conduit, etc., pick the **GRIFFIN NON-STRIP**. Teeth don't snap out.

For precision contour cutting, pick **GRIFFIN BAND SAWS**. Four types for metal-cutting and wood-cutting.

Write for latest Griffin Price List, giving full descriptions, sizes, selection tables, etc.

General Sales Agent

JOHN H. GRAHAM & CO. INC.,

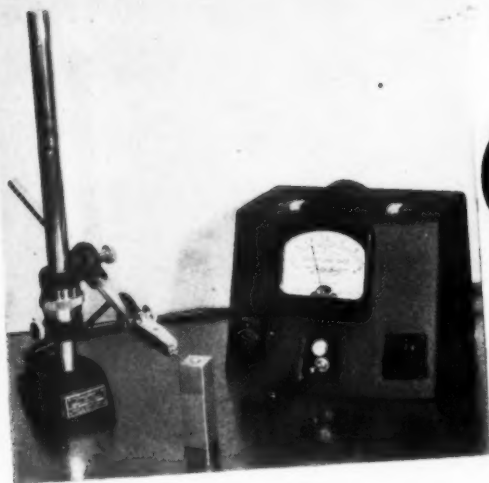
Dept. E, Duane St., New York 7, N. Y.

ASK YOUR DISTRIBUTOR FOR



HACK SAW BLADES and BAND SAWS

Made by G. W. GRIFFIN CO., Franklin, N. H., Hack and Coping Saw Blade Specialists since 1880



Merz New-Tronic Height Gage. Furnished complete with stand.

1
Speed

2
Accuracy

3
Flexibility

Merz NEW-TRONIC Gaging Equipment GIVES ALL THREE

Merz New-Tronic equipment offers exceptional speed and accuracy—as well as cost-cutting flexibility—on a wide range of gaging and sorting operations. Manufactured and sold exclusively by Merz, under famous electronic patents acquired from Jack & Heintz, New-Tronic equipment is available in three types:

MERZ NEW-TRONIC HEIGHT GAGE: Furnished complete with stand, which is equipped with *fine-adjustment* for speed and convenience in operation. Gaging head mounting is provided with a standard A.G.D. lug, making unit readily adaptable for use with existing fixtures.

MERZ NEW-TRONIC BALL SORTING MACHINES: Two standard models. Model A handles balls from $3/32"$ to $7/32"$, in graduations of

$1/32"$. Model B handles sizes from $3/16"$ to $1/2"$, in graduations of $1/16"$. Both make ten selections automatically, to an accuracy of ten, twenty or 50 millionths. Special shims are available for other increments. Speed of both models is 3,600 balls an hour.

MERZ NEW-TRONIC COMPARATORS: For external measurements. Four models, with fixed or adjustable work-contact pressure. Each model is equipped with two magnification scales.

It will pay you to get complete information on these high-speed precision units, as well as on other types of Merz equipment. Write for full details.

MERZ ENGINEERING COMPANY • INDIANAPOLIS 7, INDIANA

New-Tronic Gaging and Sorting Equipment—New-Matic Measuring Machines—A.G.D. Standard and Special Gages—Tools and Special Machinery—Experimental Projects.



PERFECT CONTROL



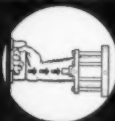
More than a
"muscle saver"—T-J

Air and Hydraulic Cylinders
give you accurate automatic control
for operations of all kinds where
pushing, pulling or lifting is needed.

Depend on T-J Cylinders to simplify machines... save time and labor... and do the job *right* at all times. Available in many standard sizes and styles... 100 lb. or 50,000 lb... both cushioned and non-cushioned types. Precision-built with rugged dependability... backed by 31 years of know how. Write today for catalogs. The Tomkins-Johnson Co., Jackson, Mich.

FOR TOUGH JOBS SPECIFY

For PUSH-PULL-LIFT Jobs



with **T-J**
CYLINDERS

SAVE LABOR!

SPEED PRODUCTION!



T-J

TOMKINS-JOHNSON

RIVETERS...AIR AND HYDRAULIC CYLINDERS...CUTTERS...CLINCHERS

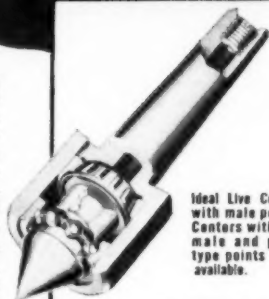
They Cut Job Time in Half...

with **IDEAL Live Centers**

Mr. Paul Schmidt, foreman winding department, Milwaukee branch of the John Oster Manufacturing Co., Racine, Wis. says: "By using Live Centers when turning the commutators on our Wound Armatures we have reduced the (handling) time by approximately 50% . . . obtain a heavier cut . . . reduce heating by friction."



This case history is typical of what's being reported all over the country. On light and heavy turning jobs, wherever they are used, Ideal Live Centers are raising both quantity and quality of lathe work, cutting production costs. Because they turn with the work, even on the lightest turning jobs, Ideal Live Centers eliminate all friction between work and center. There's no grabbing or gouging, no time loss for lubrication or grinding. Work is more accurate, spoilage is reduced. Deeper cuts and higher turning speeds are safely achieved. Ask for information and a free demonstration on your own work. IDEAL INDUSTRIES, Inc., Sycamore, Ill.



Ideal Live Center with male point. Centers with female and pipe type points also available.

Also Heavy Duty Live Center - built to carry heavy loads. Accurate to .0005.



Distributed Through
AMERICA'S LEADING WHOLESALERS

Canadian Distributor: Irving Smith, Ltd., Montreal

How does **SIMONDS** Pack so much "Stuff" into every Cutting Tool?

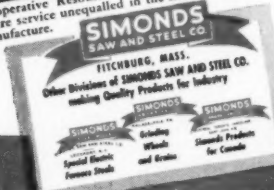
World's First
Windowless Plant
... more than 3 acres of
Controlled Working
Conditions.



Simonds' Own Steel Mill guarantees the un-
matched quality and uniformity of Simonds
cutting edges.



Co-operative Resources of 4 Simonds Companies
assure service unequalled in the field of cutting-tool
manufacture.



Here are 6 Quick Answers to this Often-Asked Question about SIMONDS SAWS, KNIVES and FILES

- 1 **Longest experience** ... 115 years. Long experience per man ... Simonds craftsmen stay with Simonds.
- 2 **World's First Windowless Plant** ... air, light, sound completely controlled for better work, higher product-quality, faster delivery.
- 3 **Simonds Steel Mill** ... Modern electric furnaces, under close laboratory control, pour all Simonds special cutting-tool steels.
- 4 **Simonds Own "Sharpeners"** ... Simonds organization includes a top producer of grinding wheels ... part of the secret of Simonds famous "Mirror Finish."
- 5 **Simonds Research**: New metals, methods, and cutting tools ... these come first from Simonds.
- 6 **Simonds 4-Company Organization**: All quality controlled from raw material to you.

That's why Simonds Tools cut your cutting costs. Order from your Distributor.



BRANCH OFFICES: 1550 Columbia Road, Boston 27, Mass.; 127 S. Green Street, Chicago 7, Ill.; 416 W. Eschb Street, Los Angeles 14, Calif.; 228 First Street, San Francisco 3, Calif.; 311 S. W. First Ave., Portland 4, Oreg.; 31 W. Trent Ave., Spokane 8, Washington. Canadian Factory: 195 St. Remi St., Montreal 30, Que.

When you use SIMONDS
You stay in the **Highlands**

OF CONSISTENT CUTTING EFFICIENCY

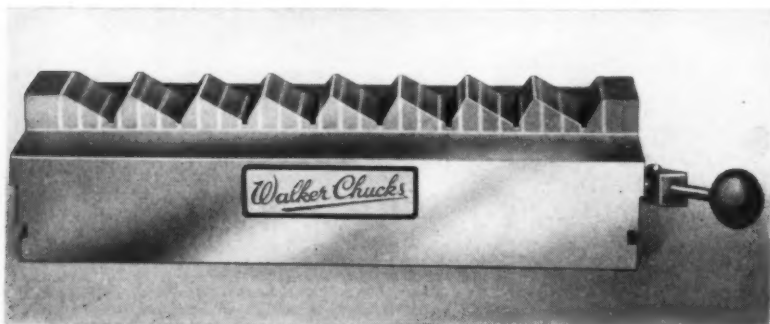
Walker Does It Again

The flexibility of electro-magnetic applications has for one-half a century been utilized by *Walker* engineers to solve many interesting and intricate problems.

Electro-magnetic devices obtain their energy from a dynamic source of current flow. Permanent magnets receive their potentialities from static external energies.

This difference was a stumbling block and limited permanent magnetic chucks and their flexibility, but *Walker* engineers have overcome this handicap and now *Walker* Permanent Magnetic Chucks are adaptable to a large and useful field of peculiar problems.

Here is a 6" x 18" Permanent Magnetic Chuck, *Walker* patent, ready for one of these unique applications:



Protected by Walker Patents

O. S. WALKER CO. Inc.

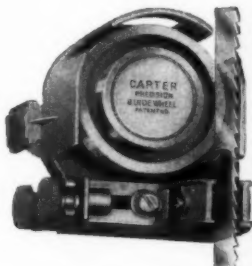
WORCESTER 6, MASSACHUSETTS

Original Designers and Builders of Magnetic Chucks

Cut **BAND SAW COSTS** *with* **CARTER** *equipment*

Surprising new economies are available to your band saw department when you adopt CARTER Band Saw Equipment. Immediately you will realize a reduction of costs and an increase in output, because, you will obtain more accurate, continuous cutting at greatly increased speeds.

- ★ **Carter Rigid Band Saw Wheels**
- ★ **Carter Quick-Change Tires**
- ★ **Carter Micro-Precision Guides**



★

Standard Equipment on most leading band saws. Scientifically designed. Constructed of qualified materials.

CARTER

PRODUCTS COMPANY

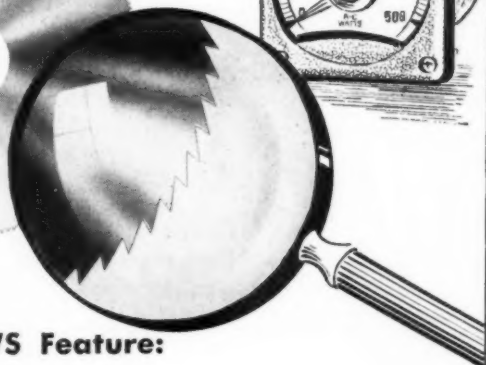
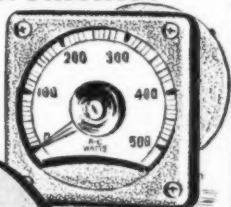
960 Michigan Trust Building
Grand Rapids 2, Michigan

WRITE TODAY!
You, like thousands of other progressive manufacturers will be interested in the features and extra values provided in CARTER Band Saw Equipment. Complete details furnished upon request.

Band Saw WHEELS • TIRES • GUIDES • GUIDE LIGHTS

CIRCLE SAWS

The Finest Teeth
For The Finest Precision Instruments!




Fine Tooth

CIRCLE SAWS Feature:

30 teeth per inch

1" to 6" diameters

Thickness .006 in standard sizes; furnished in .003 up to 1½" diameter as specials.

Throughout American Industry these CIRCLE  SAWS have provided for years the delicate precision necessary for producing fine measuring, indicating and control instruments.

CIRCLE SAWS

The "Standard" of Saw Quality

CIRCULAR TOOL CO., INC.

PROVIDENCE 5, R. I.

Chicago • Philadelphia • New York • Dayton • Cleveland
Los Angeles • Rochester • Indianapolis • Detroit
St. Louis • Minneapolis

L-W

SWIVEL BASE MILLING MACHINE VISES



MASTER \$42.25

Jaws: $6\frac{1}{2}$ " wide, 2" deep.
Opens 4" with jaws, $5\frac{1}{4}$ " without.
Wt. complete with crank, boxed, 85 lb.

JUNIOR \$31.45

Jaws: $4\frac{1}{2}$ " wide, $1\frac{3}{4}$ " deep.
Opens 3" with jaws, $3\frac{1}{2}$ " without.
Wt. complete with crank, boxed, 35 lb.

HUSKY 3" \$18.80

Jaws: 3" wide, 1" deep.
Opens 2" with jaws.
Wt. complete with crank, 16 lb.

★
STEEL JAWS
Suited to drill press and shaper work.
GRADUATED BASE
Can be used plain or swivel.
LARGE ACME STEEL SCREW
Contributes sturdiness and durability.
FOUR BOLT AND KEY SLOTS
are provided for rigidly attaching to
machine table so that work holding
surfaces are at true right angles or
parallel to table.

Send for complete catalog giving prices and specifications on these quality, low-cost L-W Products



DEMAGNETIZER



MAGNETIC CHUCK



GRINDING WHEEL



DRILL PRESS



DEMAGNETIZING SWITCH



LATHE CHUCK



UNIVERSAL CHUCK



POWER HAUL SAW



MILLING MACHINE VISE

L-W CHUCK COMPANY

23 SO. ST. CLAIR ST.
TOLEDO 4, OHIO

PRACTICALLY INDESTRUCTIBLE!

ACME BENCH VISES have ALL these features

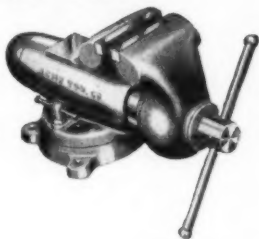
Maximum Gripping Power * Longer Vise Life

No Side Twist * Unbreakable Sleeve Nuts

Interchangeable Ground Jaws * Swivel Bases

11 Sizes from 2" to 6"

Also ACME COMBINATION PIPE AND BENCH VISES with same outstanding features have 4½" wide jaws. Holds pipe ⅛" to 3½".



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DEPENDABLE ACCURACY



INSPECTION TOOLS made of MEEHANITE METAL are designed to fill your various Inspection and Checking needs. Sturdily constructed to give you reliable, accurate service.

Surface Plates — Box Parallels

Slotted Angle Plates

Universal Right Angles

Flat Parallels — Lapping Plates

Toolmakers' Knees — Straight Edges

Masterangle Plates—Angle Attachments

Try Squares

ALSO—SURFACE PLATES RESCRAPED—
LIKE NEW

VISIT OUR BOOTH 732
METAL SHOW
Philadelphia
Oct. 25-29

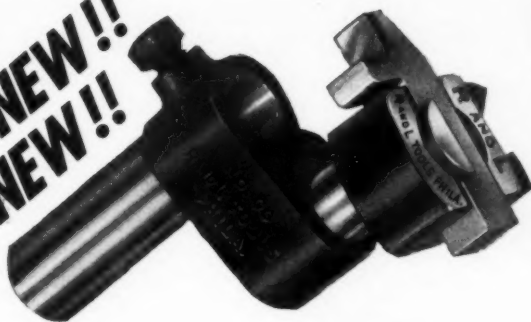


**PRECISION
REDUCTION
TOOLS**

ACME TOOL COMPANY

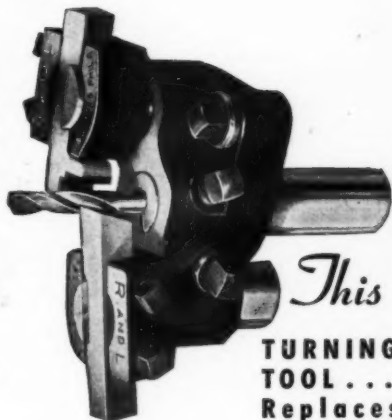
71 W. BROADWAY NEW YORK 7, N. Y.

**NEW!!
NEW!!**



R AND L TURRET BACK REST HOLDER

For use on R and L Turning Tools. Simple design allows for convenient interchanging of the R and L carbide surfaced or Roller Backrest (above) and the R and L Burnishing Backrest shown below. Built in sizes to fit all R and L Turning Tools.



R and L Tools Changed in Ten Seconds for Right or Left Hand Turning.

Manufacturers of Precision Tools for Screw Machines.

Also Turning Tools . . . Roller Backrests . . . Carbide Backrests . . . Tap and Die Holders . . . Universal Tool Posts.

This

**TURNING
TOOL . . .
Replaces
14 TOOLS**

Can be changed from
RIGHT to LEFT
... in 10 Seconds

Write for Literature

R AND L TOOLS

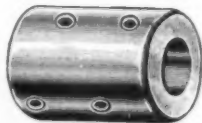
1825 BRISTOL ST., NICETOWN, PHILADELPHIA 40, PA.

Yes!—they're all Chicago DIE CASTING Stock Items

The castings displayed on this page are just a part of our Stock Line. You save time and money when you use Chicago Castings.

Make our factory your headquarters for your casting requirements.

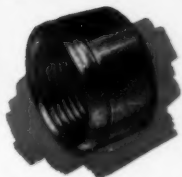
For complete information write for CATALOG No. 46



Chicago DIE CASTING MFG. COMPANY
2512 West Monroe Street, Chicago 12, Illinois



A Finished Piece Every 2.5 Seconds..



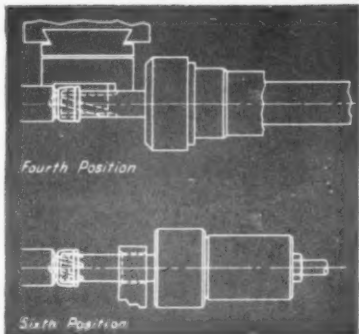
**Thanks to • High Speeds • Heavy Feeds • Carbide Tooling
... on a NEW BRITAIN AUTOMATIC**

"You can't drive a spike with a tack hammer." You just can't handle the high speeds and heavy feeds that, with carbides, mean high production unless you have a machine that is built from the ground up to do the job.

Here's a case where a carbide-tooled New Britain Model 601 automatic operating on aluminum at spindle speeds of 3352 RPM, with a forming SFM of 1098, produces 1433 finished pieces per hour in eight operations.

Carbides can mean new standards in speed and economy in your plant. To help you attain them New Britain makes the only automatic screw machines designed with the power, speed, weight and rigidity to get the full benefit with carbides.

After forming and drilling in the first three positions a carbide skiving tool with no back clearance burnishes the piece eliminating a secondary polishing operation and readying the part for immediate plating.



Tapping is done in the fifth position. Breaking through the $\frac{1}{64}$ " radius, a finish reamer cuts off in #6. This leaves a complete radius blending in with the back face as specified by the manufacturer. The piece is stripped from the reamer on drawback stroke. Ordinary cut-off methods would have required secondary grinding.

**Write for descriptive literature on
new Models 601 and 602**

At left: Easily accessible cams, directly behind cross slides, eliminate deflection and permit heavy forming cuts of carbides.



NEW BRITAIN
Automatics

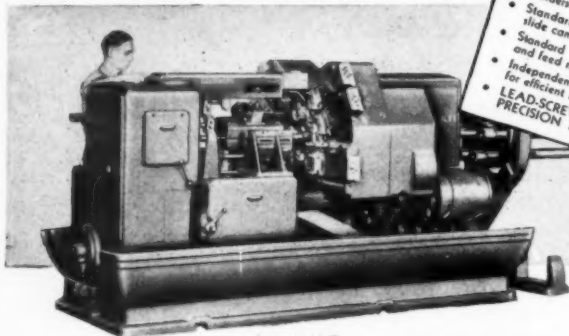
THE NEW BRITAIN MACHINE COMPANY
NEW BRITAIN-GRIDLEY MACHINE DIVISION
NEW BRITAIN, CONNECTICUT

948HF2

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

97

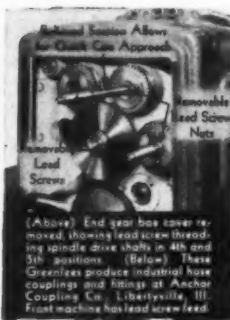
LEAD-SCREW FEED FOR *Better* PRECISION THREADING....



- Wide open tooling area.
- Quick main tool-slide stroke settings on graduated worm wheel holders.
- Interchangeable cross-slides tool slide cams.
- Standard interchangeable cross-and-feed mechanism.
- Independently operated cross-slides for efficient metal removal.
- LEAD-SCREW FEED FOR BETTER PRECISION THREADING.

HAS BEEN ADDED TO THE
OUTSTANDING FEATURES OF

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(Above) End gear has cover removed showing lead screw threading spindle drive shafts in 4th and 5th positions. (Below) These Greenlees produce industrial hose couplings and fittings at Anchor Coupling Co., Libertyville, Ill. First machine has lead screw feed.

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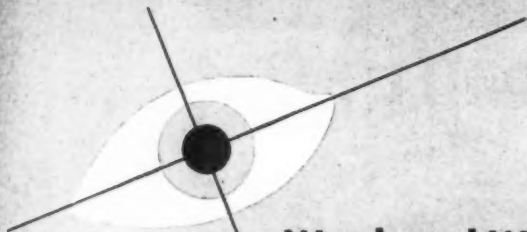
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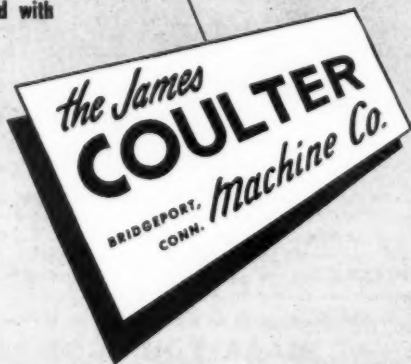
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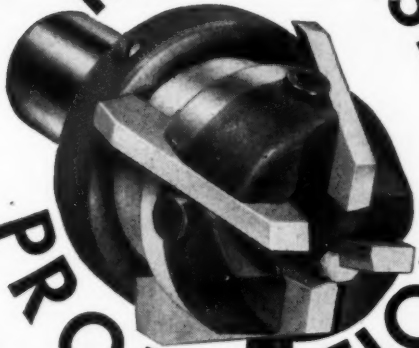
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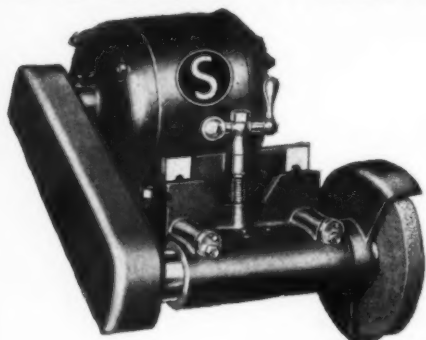
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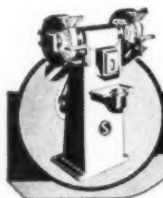
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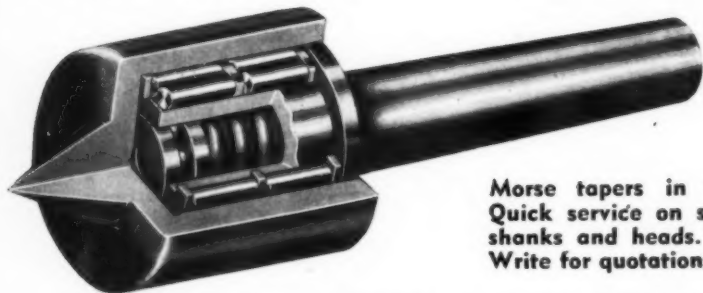
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Featured in this issue

INTERESTING STAMPING OPERATIONS AT NORRIS STAMPING AND MANUFACTURING CO., by Gerald Eldridge Stedman. The deep drawing of square tubs is described by the author. Many original tooling and drawing practices distinguish operations at Norris. Page113

SHEAR CUTTING SPEEDS PRODUCTION OF MOTOR SHAFTS, by P. H. Foley and H. L. Seekins. The shear cutting process is no more than the turning of motor shafts by means of a broaching operation. The broach is slowly fed across the slowly revolving shaft. Page121

THE USE AND OPERATION OF SINGLE AND MULTIPLE SPINDLE AUTOMATICS, by Ralph A. Warren. This is the first of a series of articles on screw machines written by a consulting engineer who has spent the better part of his life in the screw machine industry. He is the author of the well known books, "Warren's Books on Automatic Screw Machine Engineering." Page133

LETTER FROM ENGLAND. Page143

SELL THE WORLD'S BEST INVESTMENT, by J. C. Hebert. A formula is needed, based on fundamentals, that can be used to figure earnings made possible through the use of modern machine tools. While the machine industry has done a good job of selling the operating personnel on new tools, the operat-

ing personnel has not been too successful in selling top management. This stimulating article should be "must" reading for every machine tools executive. Page153

NMTBA SALES REFRESHER COURSE, LECTURE 1, A SURVEY OF MACHINE TOOL BUYERS, by Herbert L. Tigges. This is the first of many articles dealing with the sales problems of the machine tool industry. The same principles of selling apply to general industry. It is hoped that the presentation of these lectures, delivered at Cornell University, will stimulate the thinking of sales and other executives. With these articles the MACHINE and TOOL BLUE BOOK now covers all phases of metalworking from design through production to sales. Page163

AVAILABLE LITERATURE. Page179

NEW BOOKS. Page184

NEW INDUSTRIAL FILMS. Page187

WHAT'S NEW IN METALWORKING. Page199

NEWS OF THE INDUSTRY. Page288

APPOINTMENTS AND PROMOTIONS. Page294

MECHANICS THROUGH THE AGES. Page324

PRODUCTS INDEX. Page326

INDEX TO ADVERTISERS. Page334



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As the Editor SEES IT

SALES AND MERCHANDISING IN A MACHINE TOOL MAGAZINE?

Readers might well raise quizzical eyebrows over the inclusion of sales articles in an industrial magazine specializing in technical articles. It is well, therefore, to explain the reasons for publishing this sales material and inasmuch as such material will be a monthly feature of the BLUE BOOK, reassure our readers that technical articles will neither suffer in quantity nor in quality as a result.

The editors of the MACHINE and TOOL BLUE BOOK have long felt that a magazine serving the metalworking industry, and listing among its readers owners of businesses, presidents, vice presidents and other management executives, was but partially fulfilling its responsibilities if it did not—besides garnering and imparting information on new tools and methods—if it did not yield intelligence on the selling and marketing of finished products. Hence, this issue carries the first of many articles, written by sales experts, designed to stimulate the sales thinking of the metalworking industry.

Beginning a series of sales articles at this time is particularly propitious. The

current of buyers' resistance is gaining strength. The war, followed by the post-war sellers' market, transformed many salesmen into order takers, and sales departments became flabby. These halcyon days of orders bouncing in over the transom are on the wane. Salesmen need brushing up, or off. Sales departments must substitute piloting for drifting; for the current is swift and only farsightedness will reveal treacherous shoals and cruel rocks.

The Sales Refresher Course, recently held at Cornell University for machine tools salesmen, is evidence of our industry's awareness of the turn of affairs and of the implacable necessity for more productive selling techniques. To this end the leaders of the machine tool industry have given freely of their time and of their knowledge by preparing and delivering lectures designed to increase selling efficiency. We cannot think of a better way to serve our readers than by publishing these sales lectures in this and in future issues of this magazine. Thus the MACHINE and TOOL BLUE BOOK becomes one of few magazines serving the metalworking industry from the blueprint to the order book.

William F. Schleicher
Editor

A BUYING GUIDE FOR ABRASIVES

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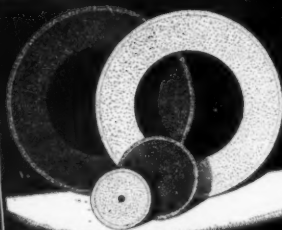
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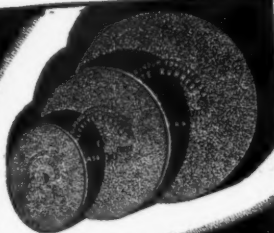


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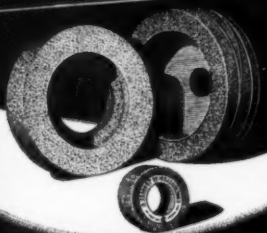
A Good Rule for Good Grinding



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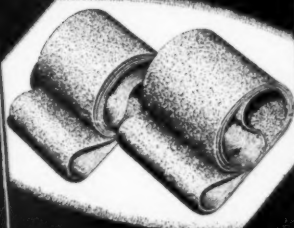
Cutting-off wheels... the modern tool
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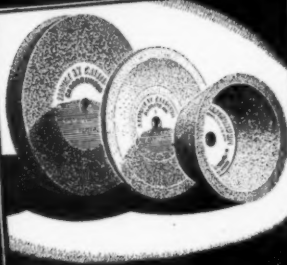
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intelligent, ever alert to do the job still better. Encouraged to advance their own ideas, our employees often assist in determining practical alternates when great demand causes shortages of the steel you need. To put this kind of service to work for you, contact the nearest Ryerson plant next time you need steel. You can be sure we shall do our best to serve you.

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RYERSON STEEL

Interesting Stamping Operations at **NORRIS STAMPING and MANUFACTURING CO.**



by Gerald Eldridge Stedman

Original tooling and clever adaptations result in high output. The deep drawing of square tubs and fabrication of collapsible spouts is described by the author.

THE Norris Stamping and Mfg. Company of Los Angeles, organized in 1931 by K. T. Norris, still active as its president, employs over 1200 people, fabricates a variety of products, such as tubs, skirts and spinners for washers, stamped metal bath tubs, automobile wheels, aluminum powder boxes, 8" cartridge cases and its own line of copper bottom, stainless steel cookware known as "Thermic Ray". Its metal-working skills reflect much that is distinctly superior. Its tooling contains much that is original and includes clever adaptations. Its management abilities are reflected in the low turnover, absentee, lost-time accident and supervisory ratios of its plant. Employees of this company share in profits through the Norris Employees' Fund, a trust set up for this purpose. This may account for high manhour production of the shop.

In this article I shall describe operations observed in the routing of the top section and tub skirt produced by Norris for Hurley washing machines, thereafter detailing high production in the fabrication of collapsible spouts.

DON'T MISS the Sales Refresher Course lectures. Beginning this issue of the BLUE BOOK.

Tub stock is cold rolled 19 ga. (.0148") steel sheet, received flat and craned to Cincinnati shears for squaring corners and moved to circular shears for 51½" dia. blanking after which it comes by Clark Tractor to presses for draw, after being hand oiled.

Two initial draws are involved on this tub fabrication, somewhat unique in that forming is cupped round and then drawn square. The draws are on 225 T hydraulic Clearing presses, set side by side. They have a common underlying pneumatic system which circulates and re-circulates oil to win proper pressure for the blank holders. The press action is therefore, pneumatic-hydraulic. Drawing pressure is 150 T and pneumatic pressure is 1800 psi. on the cylinders.

On the first draw, the 51½" dia. blanks are cupped to gain a 28" dia. 16" depth in one hit at 110/hr. By the pushing arrangement which is the pneumatic feature, the redraw forms a square tub 24" x 24", 16" deep. The work then receives a blank and re-

verse draw center and restrike offset on a 200 T HPM. Standard production per hour is 95 pieces, but the line was running 110/hr. at the time of my visit.

Next operation curls



- Fig. 1. First operation in process of making square washing machine tubs. This is a deep draw operation from a large disc to a round tub.
- Fig. 2. Removing tub after redraw, re-shaping round tub to square tub.



Fig. 3. Closeup of washing machine body expanding die, showing detail of sectional components.

a 3/16" radius on the tub rim, flanges and pierces a drain 7/8" hole. This work is on a 55 T Lake Erie and standard press practise prevails. The open end is trimmed on a Whiting Quickwork trim machine and the work moves to burden center by truck. This is some distance away.

The tub next goes to a 50 T HPM equipped with sectional expanding dies to be set for size. There is unavoidable buckle obtained in the foregoing general press work which must be removed. Strike is from the inside and expanded, using dies of unusual expanding design. Others performing this fabrication use three strikes (bottom, center, top) to accomplish this expansion. Norris does it in two — top and bottom. The die involved has eight sections; four corners and four sides.

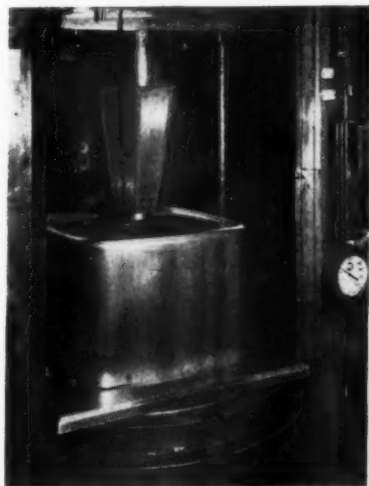
Thereafter a 15/16" inside hole is pierced, using a 40T Bliss horn press and, after a wash to remove drawing compounds, the work is trucked to porcelain enameling. The tub sets

against the shoulder and seam-welded bottom of the skirt in assembly.

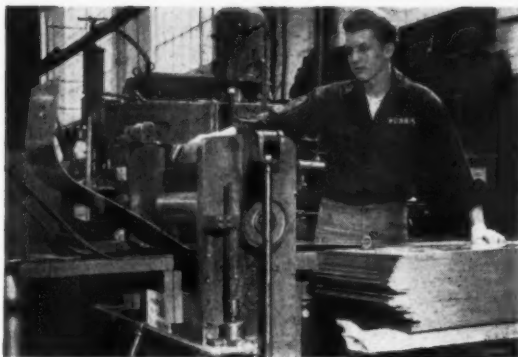
The floor area given over to forming the skirt is only 20' x 12' and has compact line flow, from which great production per square foot is obtained. Skirt is formed out of 20 ga., 30 3/8" x 80 1/2" cold rolled steel sheet. These are first sheared in Cincinnati squaring shears to produce two pieces 15 5/16" x 79 15/16" and are then trucked to form square.

A Norris air-actuated, "home made" machine bends the four sides of the skirt and the work passes manually to the Federal 50 KVA tack welder. Toggle clamps feed the work to a Z bar, providing an overlap of 1/8". The carriage drive is actuated by air cylinders. Work is automatically timed to six tack welds. Thereafter, the skirt comes to the Taylor-Winfield seam welder, held

Fig. 4. Expanding die in operation in 50 ton HPM press. This operation removes buckle from body.



• • •
Fig. 5. Air-actuated machine bends sides of skirts in three stages.
 • • •



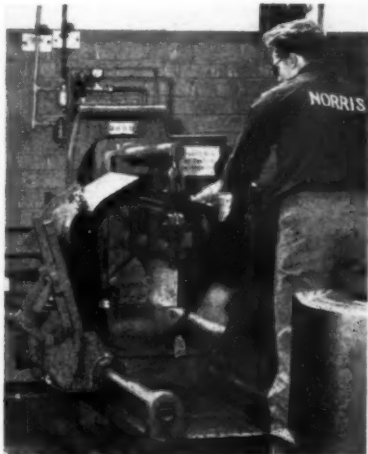
by toggle clamps, for complete seam welding, production here being 143/hr.

The skirt is wiped with water and comes to ram-actuated expansion on a 50 T HPM using the same technique as the tub. The exception, in relation to these expansion dies, is that the tub

uses a hold-down ring and added cams on the back side to size the bottom of the top tub half. The skirt is double-expanded, being sized for base and its top is expanded to fit the tub assembly.

Thereafter, the work receives trim and restrike for embossure in four hits

• • •
Fig. 6. At right, folded skirt is set into tack welder. At left, after tacking the skirt is seam welded.



on a 41 Bliss horn press, production here being 152/hr. Then a blank and flange of a large opening in the inside and piercing of 4 small holes for the control box installation is accomplished on a 40 T Bliss. Final work of piercing three holes and the curl and flanging of an inspection hole, brings the work to grind of access weld flash and the skirt is trucked to paint. All work in the paint department is conveyORIZED after solvent wash and degreasing. Production on this line is 72/hr.

The means and methods which metal-working plants are now using to conserve steel in the present shortage is worth a feature article in itself. I have marvelled at the inventiveness of redesign, both of products and machine tools to make this possible. Norris is particularly successful at it, this having been a long-practised shop policy with them. Wherever possible they generate stock by shearing corners or by utilizing knock-out blanks for other stamping purposes.

Among its many production items, Norris fabricates a pour spout assembly and vent tube that snaps onto it. Various trick machines are used of Norris design, or adaptations for this production, and unusually high production per manhour is achieved.

One such machine, producing the vent tube, achieves a sequence in one operation that forms a rectangular blank into a locked seam, rectangular-shaped tube which snaps into its female holding member on the pour spout. Production here is 1000/hr.

The spout consists, among other components, of a flanged and beaded spout mouth and three rings which are fitted into a cone assembly similar to the old collapsible drinking cups. These, in turn, are fitted into a swedged cone holder which, accompanied by a washer, is equipped with a perforated facing ring that carries the integral rectangular nozzle stamping to which the vent tube

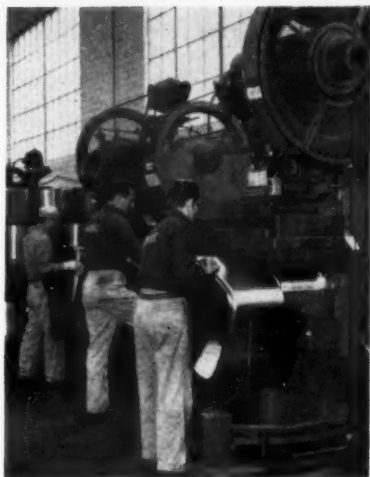


Fig. 7. Long view of three stages of trim, restrike, blanking and flanging of various openings and holes in the skirt.

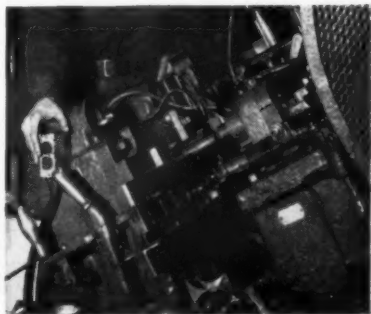
• • •

snaps on. All this represents ingenious stamping and forming.

Initial operations are accomplished on

• • •

Fig. 8. Automatic inclined press blanks and forms nozzle cups of collapsible pour spout.



Bliss 821 automatic strip feed presses with variable speed drives and at production rates of 7500 hits/hr. None operate at less than 5000 hits/hr.

I noticed Passon pull-back guards being used by operators on certain presses in this spout department. This guard is actuated by a cam attached to the ram of the press with cables running through a conduit to wrist bands which pull the operator's hands back and away from the point of operation with each stroke of the press, pull being measured for $\frac{3}{8}$ " clearance.

Assembly of these spout components represents the highest degree of hand dexterity. Not one in 100 women attempting these assembly operations have the necessary skills to stay at it. For example, the subassembly of the four cone units into the collapsible component is at a 1000/hr. rate. Final assembly of cone subassembly, nozzle, flange, washer is at the same rate. This ends up with a machine crimping of



Fig. 9. Multiple operation trims, pierces, forms flange and stamps brand name on nozzle part of pour spout assembly.

the washer around the nozzle.

One of the interesting special machines produced a screw cap for a spout in one operation in which the automatically fed strip was cupped, knurled, threaded, beaded and a paper liner was cut and inserted—all in one operation at 3000/hr. hits. THE END.

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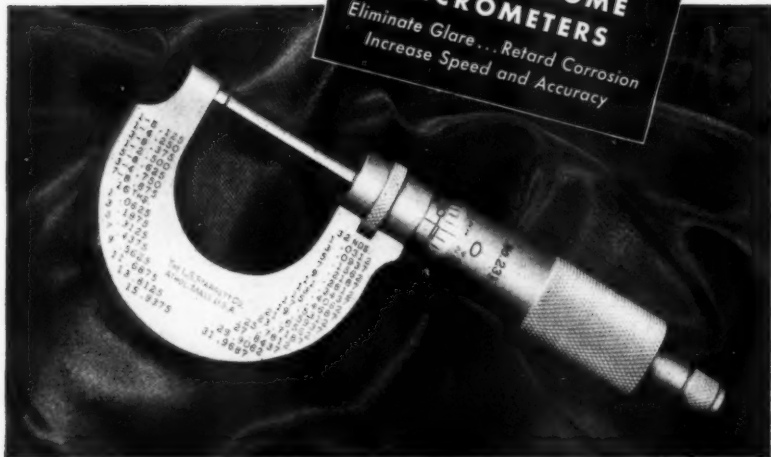
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SHEAR CUTTING

Speeds Production of Motor Shafts

by **P. H. Foley**, Small and Medium Motor Engineering Division, and
H. L. Seekins, Aircraft Gas Turbine Divisions,
General Electric Company, Lynn, Mass.



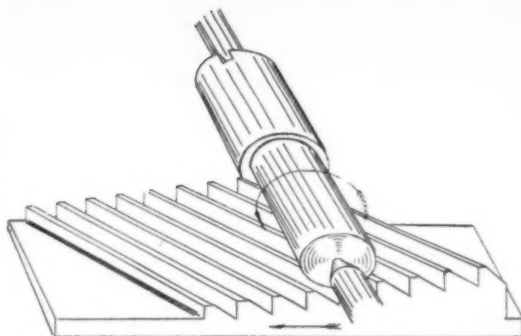
In the shear-cut process, the shaft being machined is revolved slowly, while a formed broach is fed across the shaft on a tangent line. This process has resulted in greater production and a reduction in manhours for the Lynn Works of the General Electric Company.

IN THE Lynn Motor Division of General Electric Company, various types of Tri-Clad poly-phase and single-phase motors, one to twenty horsepower, are manufactured.

The shafts of these Tri-Clad motors have more precision finished surfaces than any other individual part: the pulley diameters, the journals, seals, shoulder lengths, all must have close tolerances. It is apparent that on any size or type of motor that the shaft warrants a large share of the machine and tool planning effort. New and better methods are constantly being applied on all parts, but we shall describe one very novel development for machining Tri-Clad motor shafts.

This machining method, called shear cutting, is illustrated in principle by Fig. 1. In the shear-cut process, the shaft being machined is revolved slowly while a formed broach is fed across the shaft on a tangent line. To better explain how this came to its present stage of development, we must go back into the colorful history of this idea. In the early 30's an engine lathe for the first trial of shear-cutting a small shaft

Fig. 1. Illustration of the shear-cut principle. The shaft is turned in an engine lathe. The formed broach performs the cutting operations.



was set up at the General Electric River Works. The first set-up was quite simple, just a tool bolted to the cross-slide of the engine lathe. The shaft stock was driven on one end by a chuck, and the other end was supported on the tail-stock center. The toolbits were ground to produce the desired shearing action as the tool block was fed under the shaft. Each toolbit was adjusted by trial and error until each one removed an equal amount of stock and produced the required finished dimensions. This new method of machining, even though it was only experimental, showed considerable promise. Once the individual toolbits were set and locked in position, duplication of the original shaft became a simple matter of feeding the

tool holder under the shaft stock. This duplication was within a few thousandths of an inch for every dimension over the entire length of the shaft.

An engine lathe was then tooled up for a lot size of over 50,000 motor shafts. The major development work on shear-cutting was carried out on this engine lathe set-up. The stock size for the production shaft used was $\frac{7}{8}$ inch diameter by 15 inches long, of S. A. E. 4140 or similar steel specification. This type of material, even at its best, is a difficult material to machine on a production basis. The worst possible conditions were encountered in this long, slender shaft of a tough material. Therefore, by doing the development work on this shaft, nearly all the possible basic prob-

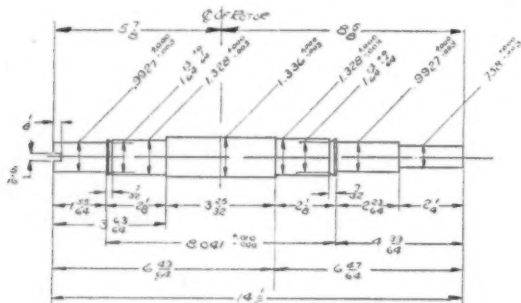


Fig. 2. A typical motor shaft showing dimensions and tolerances of shear-cut operation. The pulley diameters, journals, seals and shoulder lengths, all must have close tolerances.



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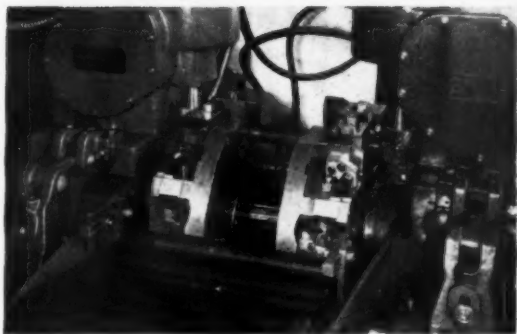
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WRITE FOR BULLETIN P-47



Fig. 3. Magazine-loaded, drum-type cross mill and centering machine. Here motor shafts are milled to length, including driving slot, centering, loading and unloading. The close up shows the loading and milling position.



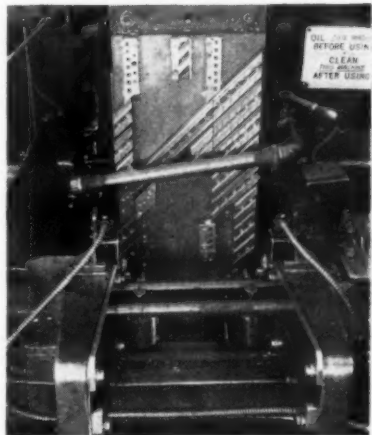
lems were solved.

This first production set-up followed closely the original experimental set-up. High-speed cutters were mounted on tool blocks 15 inches wide by ten inches long. Each cutting edge of a cutter was ground in steps to divide the cutting load and to provide the desired finish and the required diameter steps between adjacent dimensions. The work was driven by a three-jaw chuck while the cross-slide fed the shear-cut plate under it at the required feed to produce .005 inch chip load per tooth. To reduce the lost time of retracting the cross-slide after a cut, an air grinder, used as an air motor, was coupled to it. This retracted the cross-slide in a matter of seconds while the operator was changing shafts. A few bent shaft blanks which came through from the saws caused considerable trouble until they were eventually separated. These bent shaft blanks would cause an excessively heavy cut on one side over the entire length of the shaft, causing the chuck to slip, with possible damage to the chuck jaws, cutting tools or center.

The results of this development run far exceeded all expectations. Close tolerances for this class of work were held on the shear-cut turning; all dimensions were held within .003 inch tolerance, with a maximum grinding al-

lowance of .008 inch, and closer limits on the end dimensions where less spring was caused by the pressure of the tools. It was formerly necessary to rough grind critical diameters before finish grinding, but with this new ma-

Fig. 4. The relative positions of the feed mechanism and the shear-cut plate. The shaft blanks feed down the upper leg of the "V" to the work position and down the lower leg to the unloading storage position.



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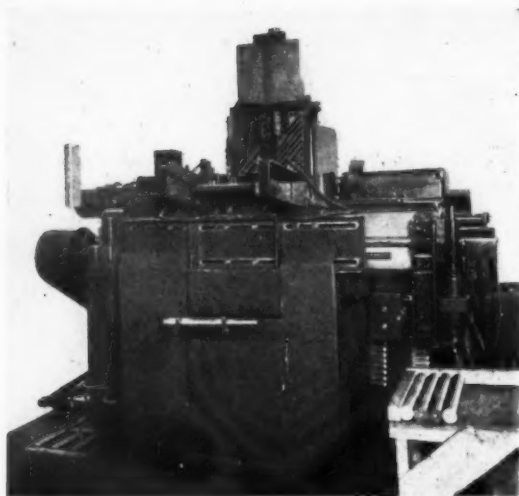


Fig. 5. One of the first shear-cut machines built by General Electric for machining motor shafts in large lots. The front view shows the rough stock in upper magazines, and machined shaft in unloading magazine. Skiving or shear-cutting tools at rear of machine.

chining method, the rough grinding was entirely eliminated on all dimensions and finish grinding was eliminated on some dimensions of this particular model of shaft.

The present Tri-Clad Motor was now in the design stage. It was necessary to develop the latest machine tools and methods to produce the higher precision

required by the greater life and efficiency which were being designed into this new motor. From the experience gained on the 50,000 motor shafts, a proposal was made for new equipment for machining the larger lots of shafts. The following comparison was made after a study of the larger production lot sizes:

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- 1—G.E. Built Centering Machine

PROPOSED SHEAR-CUT METHOD

Cut-off; Cross-mill, Face ends and center:

- 1—New semi-automatic bar feed cut-off machine
- 1—New Magazine Loading four-head machine for cross-milling, facing & centering.

SECOND OPERATION

Rough Turn & Square, two Operators:

- 4—Hand operated lathes.

Turn on Shear-Cut Lathes:

- 3—New Magazine Loading Shear-cut lathes.

THIRD OPERATION

Mill Keyways, One Operator:

- 1—Multiple fixture, hand operated miller

Mill Keyways, one operator and one set-up man for first, second and third operations above:

- 1—New Magazine loading single fixture, full automatic Keyway miller.

FOURTH OPERATION

Rough and finish Grind, Five Operators:

- 5—Cylindrical grinders, hand operated.

Finish Grind & polish Radil, One operator:

- 1—New Cylindrical grinder, equipped with Nortonizer automatic electrical sizing device.
- 1—Engine Lathe, 1—Operator, part time.

This proposal was adopted and design was started on each of the machines. Each machine required individual development to best adapt it to the magazine loading, automatic cycle of this method.

The cross-mill and centering machine deserves attention in this story, because of its necessity for the successful operation of shear cutting. In order to completely machine a shaft in one pass of the shear-cut broach, neither a chuck nor dog drive can be used. A diametrical

slot milled across one end is used for driving. This cross-mill and centering machine is shown in Fig. 3. It has a four station indexing head, each station holding one shaft. The first station is for loading from the magazine; the second, for milling both ends to length and milling the driving slot; the third, for centering; and the fourth station unloads into the holding magazine.

The design form of the shear-cut Lathe was away from the conventional lathe. To provide gravity magazine

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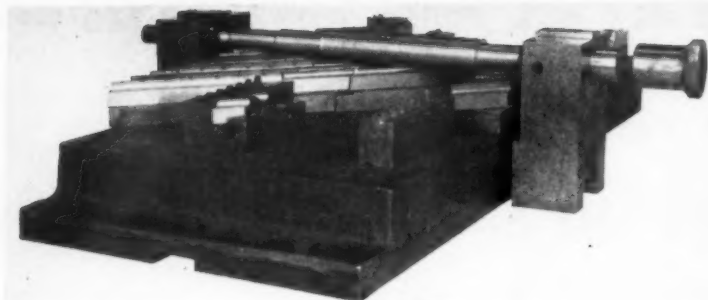
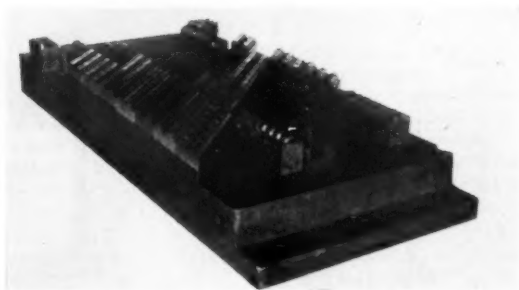


Fig. 6. Close up of the shear-cut broach, and shaft immediately after shear-cutting. The various arrangements of cutting tools for the varying diameters of the shaft are plainly visible.

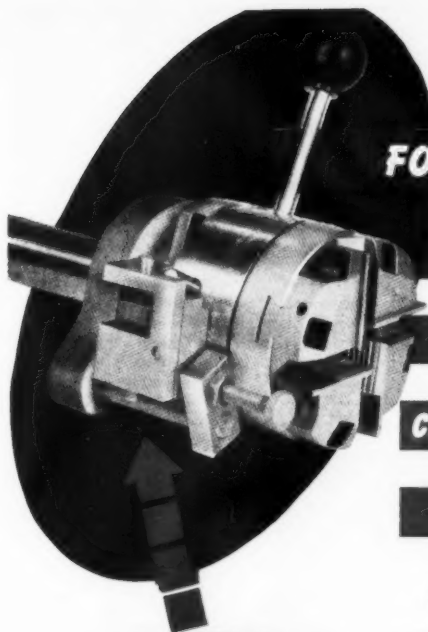


loading and unloading, the machine was designed for the shear-cut plate to move on a vertical slide. The magazine arrangement has the form of a horizontal "V". Fig. 4 illustrates the relative positions of the feed mechanism and the shear-cut plate. The shaft blanks feed down the upper leg of the "V" to the work position and down the lower leg to the unloading storage position. The vertical design of the machine also provided the maximum rigidity for the minimum of floor space required. The compact vertical design is illustrated by Fig. 5. Fig. 6 is a close-up of a shear-cut broach, and Fig. 7 shows a broach and shaft just after shear-cutting. THE END.

NEW PLANT FOR WHITMAN AND BARNES

Contracts for the immediate construction of a complete new plant for the Whitman & Barnes Division of the United Drill & Tool Corporation at 40600 Plymouth Road, Plymouth, Michigan, have just been awarded to The Austin Company, Engineers and Builders, according to an announcement made today by M. J. Kearins, president of the tool company.

The project, which will involve an expenditure of more than \$2,500,000, was announced in conjunction with the 100th anniversary celebration of Whitman & Barnes. Its present operations are distributed throughout a group of multi-story buildings at Fort Street, W., and 14th Street in downtown Detroit.



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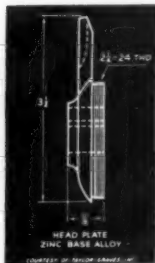
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THE USE AND OPERATION OF

Single and Multiple Spindle Automatics

by Ralph A. Warren,*
Consulting Engineer

This is the beginning of a series of articles pertaining to cams, tools, etc. for use with single and multi-spindle automatic screw machines. Since the Brown & Sharpe automatics are predominant among the single spindle machines, their movements and operations will be discussed first.

THERE IS a wide diversity of method in the operation of the automatic screw machine; and possibly less uniformity of approach, than in any other branch of the mechanical trades.

Different ways and means have been devised for various purposes, and criticism is not intended; but it would seem that better unity of operation might result, if there were a clearer understanding of synchronized cam cycles. It is reasonably safe to assume, no other branch of the engineers' profession, offers such great opportunities for developing synchronous motion, as does the automatic screw machine.

Few, if any, conventional practice can be applied along these lines; the job at hand is always different from the one just ahead; methods, manner of approach, tools, speeds, feeds etc. are only a few of the operating factors that enter into a smooth running cam design.

Cams are rotating, or oscillating, parts of a mechanism having specially formed surfaces against which a follower either slides or rolls. The driven part receives either a straight sliding or swinging motion. The body of the cam may be in the form of a plate, having a

*Author of Warren's Books on Automatic Screw Machine Engineering.

curved contour, or a cylindrical contour having a groove curvature cut into the cylindrical surface. These two types of cams, plate and cylindrical, are the ones most commonly used; both types are used on the automatic screw machine.

We will discuss the plate type only; since that type governs the turret and cross slide movements in which we are most interested.

In introducing the subject of cams, the writer believes it will be easier to start with straight line motion, rotating motion will then be quickly understood.

Fig. 1 shows a flat form of cam that changes uniform horizontal motion indicated in direction of arrow B, into intermittent motion in direction of arrow C; as the slanting rise D passes under the roll E, it raises E through the vertical distance N, and then drops back through M to uniform motion.

When the follower E is at any other position on the cam A, there will be no motion in the direction of arrow C, and the follower E would be said to be at rest.

The rest period when applied to a screw machine cam, would be called "dwell."

Fig. 2 shows the movements more complicated; when the cam A moves in the direction of arrow B, through the horizontal distance U-V; the follower E successively raises through three vertical distances, N N1 and N2, then after

dwell drops through M to horizontal motion; it can be seen the relative motion of cam and follower are always in opposite directions.

Fig. 3 shows the straight line motion of Fig. 2 converted into rotating motion; notice the similarity of shape; it might be said, Fig. 2 is Fig. 3 in straightened out form.

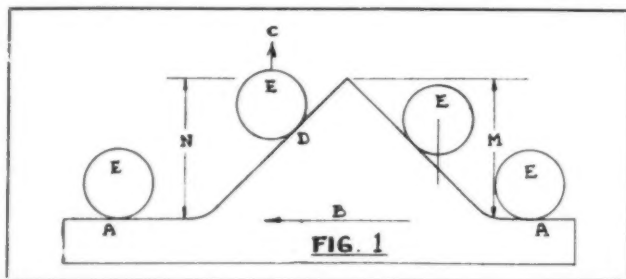
The follower E, hereafter called the cam lever roll, is fastened at end of pivoted cam lever E1, Fig. 4, so that it swings in the arc of a circle, instead of moving in a straight line. Motion is then transmitted in the direction of arrow O-1, through the cam lever E1.

The turret slide receives its forward motion through this mechanism; it will advance toward the chuck line a distance equal to the radial height of the cam rise N. The radial height N equals the amount of turret cutting tool travel, plus a few thousandths for an easy tool approach.

The length H of the cam rise, see Fig. 3, 10 to 30, is governed by the amount of tool feed per spindle revolution.

When the roll E drops through the vertical distance M, the turret returns in direction of arrow O-2, to a neutral position, and remains stationary until advanced forward by similar motion; during the drop, the mechanism controlling indexing movements, automatically revolves the turret through one station.

Most screw machine jobs require the



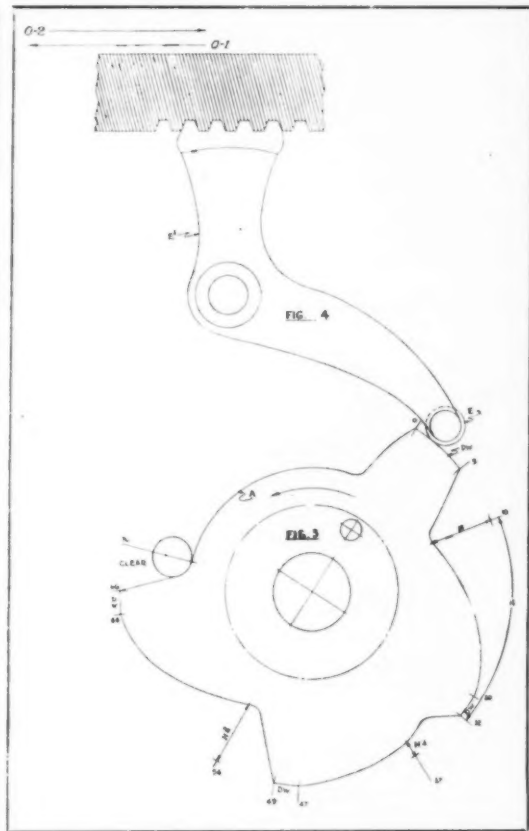
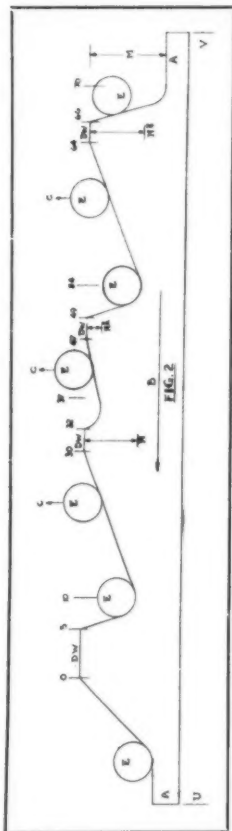
use of three cams; lead, front and rear; when the individual operations are many and varied, a vertical slide and two pickup cams often are required.

The cam circumference is divided into 100 equal spaces, and all idle and cutting tool movements are planned in accordance with these spaces; each of the three cams occupy fixed positions, when the cam lever roll E is at the zero division of any one cam, it is always

zero at the others, in other words, synchronized cam motion.

During one complete turn, the spindle revolutions necessary to finish one piece will occupy the entire lead cam circumference; if the spindle is running at the rate of 1200 RPM. and 60 seconds continuous running time is required to complete all operations, then the job would be running 2 revs. per cam space.

It is impossible to determine how



many actual revolutions will take place, until one of the regular change gear sets has been selected; therefore through the estimated or trial layout, the revs. per cam space must remain an unknown number.

The change gear sets are part of the regular equipment furnished with each machine; they represent the actual number of spindle revolutions that will take place during one cam shaft turn.

Beginning with any simple form and cut off, and through the toughest of screw machine jobs usually many individual operations enter into the completion of one finished piece; sufficient revolutions must be provided for each operation, and proportioned around the cam circumference in direct relation to the cam spaces.

Throughout the cycle of operations, there are some mechanical movements that will take place within a predetermined length of running time; two

of them are feeding of stock and indexing of turret. In this respect, single and multiple spindle machines are similar, differing only in the methods used to put such movements into effect.

On the Brown & Sharpe machines trip dogs are positioned around a carrier in accordance with a planned order of operations; as the dogs pass under a trip lever, the rear end of lever engages with a back shaft clutch, thereby setting in motion the mechanical parts which control both feedout and indexing action.

The operating time required for these mechanical parts to complete these movements is what is called "predetermined time." The length of time varies with each size and type of machine, but always remains constant for each one; ie, one-second continuous running time for a No. 2 Regular, one-half second for the No. 2 HS. machine etc. One must be careful to use the fixed time limit on



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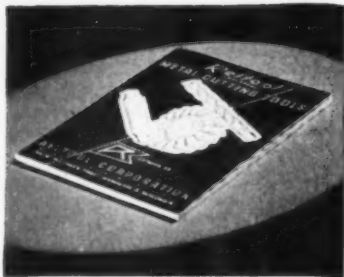
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a particular machine.

On account of the short carrier circumference occupied by the trip dogs, it is not always possible to complete these movements within the limited time; therefore, a few extra revolutions must be added, usually about 20% extras.

For example: a No. 2 Regular at the rate of 1200 RPM. requires one-second running time plus extras; the spindle revolutions that take place during one second plus extras would represent the predetermined feedout revolutions.

In some cases this rule can be applied to indexing of turret, and a like number of revs. accepted as sufficient to move the turret from one position to the next; in others, twice the number may be used before it's safe to advance the cutting tool into position. While the predetermined revs. or length of time does not change, the cam spaces may increase in numbers as the roll E drops from the top of one rise to the beginning of the next. Therefore, after the movements are complete, and spindle revolutions representing such movements allowed, more cam circumference, likewise more revolutions, may yet be needed before the roll E is positioned ready for the next forward turret travel. When such conditions occur, the only way of being definitely sure how much cam circumference is needed is by the use of graphic representations; after the amount is known some sort of dwell or clear must be provided in order to stop further turret travel until the way is clear.

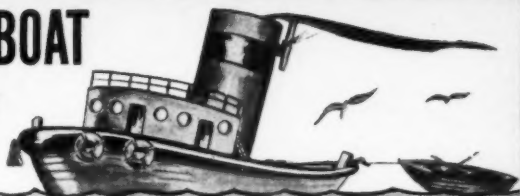
The approximate method of finding spindle revolutions and cam spaces must be used for fast running jobs; when the seconds per piece have increased to a certain point, the lead cam will then be revolving at a much slower rate, and other methods must be used.

Fig. 5 is intended to represent feedout spaces necessary for a 6 second

WHY USE A TUGBOAT

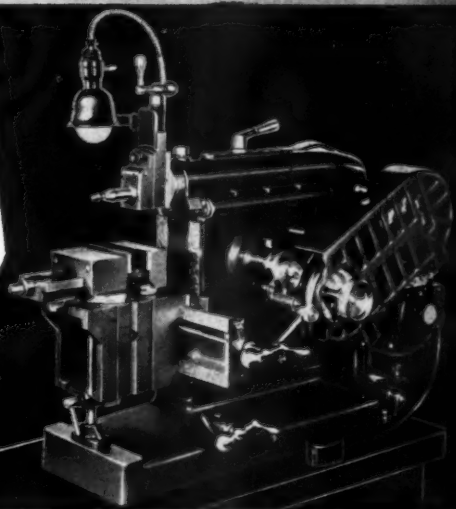
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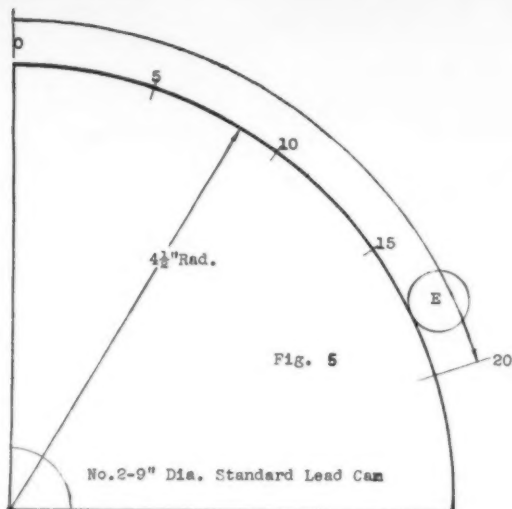
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with*



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job at 1200 spindle speed. Only 120 of the 1200 revolutions are required, or at the rate of 1.2 revs. per space. Since the predetermined time plus extras equals 24 revs., then 20 spaces must be allowed.

It appears as though a lot of unnecessary cam circumference is being wasted for one feedout movement, but none of it can be eliminated. When one stops to consider that only 1.2 revs. take place per cam space, and 24 revs. are required to complete these movements, it is easy to see why so much must be allowed.

A $\frac{3}{4}$ second job running on the No.

00 HS. machine at 6000 spindle speed, needs only 75 revs. to complete one piece, or at the rate of .75 revs. per space; the predetermined time for this machine represents $\frac{1}{4}$ seconds running time plus extras. Therefore, 40 cam spaces are required for one feedout movement. It is evident these moves need careful attention, otherwise little cam space would be available for cutting tool operations.

Other motion pertaining to single spindle machines will be offered in the next issue.

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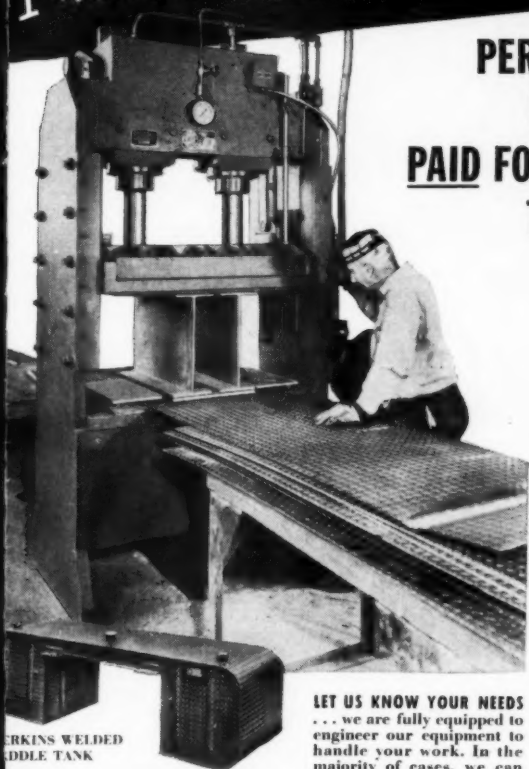
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BIG TRAILER TRUCKS eat up a lot of gas on an average run. For that reason, most are equipped with big "saddle tanks" which hold 125 gallons or more...thus obviating frequent stops to fuel up. Perkins Welding makes these super tanks out of 1/8 inch steel. Until recently, they welded angle stiffeners onto the tanks for extra strength. A KRW Engineer showed them how they could save considerably by forming stiffening ribs on a KRW 100-Ton Press. The result...savings so great that "it paid for itself in 60 days."

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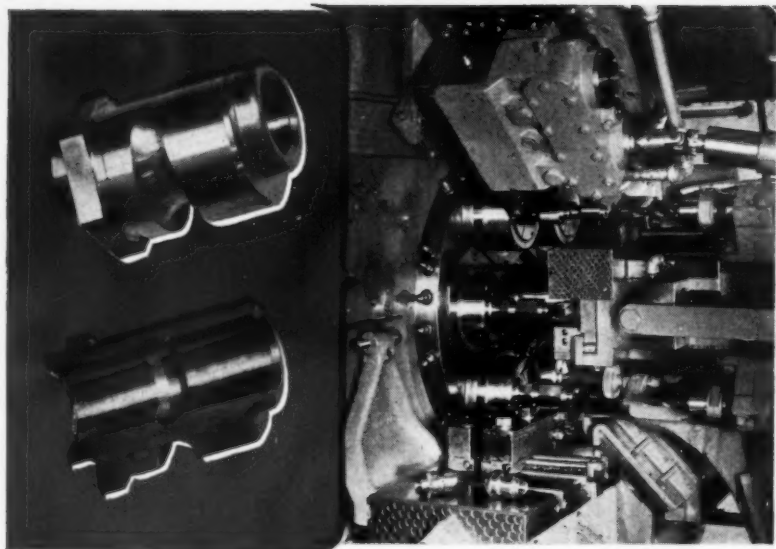
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Take the job illustrated, for example—a single setup—15 operations—total time 17½ seconds.

This steel eccentric bushing is finished on a 2" RB-6 Spindle Acme-Gridley Bar Automatic. Originally it had been blanked out on an automatic, but this operation did not include machining the eccentric shoulders, internal recessing or gouge on the O.D.—all of which had to be performed on secondary machines.

When production was switched to Acme-Gridleys, *finished* parts fell into the pan in the time formerly required to do just the first blanking operations!

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If your per piece production costs haven't been reduced in the last three years—better investigate what Acme-Gridley Automatic Tool Engineers can do for you.

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Letter from England



Written for the **MACHINE** and **TOOL BLUE BOOK** by Robert Hutcheson, Editor of **MACHINE SHOP MAGAZINE**, London, England.



The first National Mechanical Handling Exhibition which ran in London from the 12th to the 21st of July was an unqualified success. The exhibition was opened by Sir Stafford Cripps, Chancellor of the Exchequer, who commented upon the way in which the mechanisation of handling was becoming of more and more importance in our drive for production. At the opening luncheon many leaders of industry were in attendance and one very welcome guest was your countryman, Thomas Finletter, H.E. Minister-in-Charge, Economic Co-operative Administration, Special Mission to the United Kingdom.

The exhibition gave a representative cross section of the types of mechanical handling equipment manufactured in Britain and several innovations were shown. What is thought to be the first diesel engine fork truck was shown together with a truck having "body weight" steering in which steering is effected merely by the driver leaning towards the side to which he wishes to turn. A pre-selective discharge tray conveyor embodying a new pre-selection mechanism, and a new overhead conveyor which is capable of making relatively sharp bends in a vertical plane and being capable of bending in any plane were shown. The exhibition was organised by the British journal "Mechanical Handling" and the editor of that journal organised a convention which ran concurrently with the exhibition at which

papers were read by manufacturers and users of mechanical handling equipment to audiences which totalled 5,000.

On the eve of the opening of the Olympic Games temperatures in this country have risen to 88 degrees and are still going up. This hot spell follows hard on several weeks of cold and wet weather which was more suitable for winter. The news is made up largely of the happenings in Germany, especially of the "air lift" into Berlin and the difficulties of finding a solution to the peace problem in Palestine.

On top of this, Sir Stafford Cripps has announced his plans for the setting up of a joint consultation scheme under which American and British industrialists and workers will get together to advise British industry on how to produce more. It is interesting to note that Sir Stafford comments on the need for a wider dissemination in this country of American "know how"; he feels that more information could be published in this country on American methods. I am in favour of this idea as are a good many other editors of technical journals in this country. I think Sir Stafford can take it for granted that it is something we would all have been doing for a long time past if only he would grant more paper to technical publishers. The stringent rationing of paper to serious technical journals is one of the greatest bars to

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burnishing process which compresses and polishes the surface of the thread; such refinements as ratchet stop to control the measuring pressure, and decimal equivalent markings on frame or barrel. Prices, 1", \$8.75, 2", \$9.50, 3", \$10.25. Write for bulletin and order the micrometers you need now.

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Magnifies the work under inspection, floodlights it as well, and gives the immense advantage of "two-eye seeing." No wonder thousands of Magni-Rays are serving in large inspection departments, and other thousands on precision machines or critical toolroom operations. The lens is ground by experts for true magnification. Heavy base permits

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Write for full details on these tools, and for the Scherr Small Tool Catalog.

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the wide publication of technical knowledge of all kinds.

It is not everybody in this country, and probably there can be very few people abroad, who appreciate just how much technical work is done by our Post Office. In addition to the ordinary postal services by which letters and parcels are conveyed, our Post Office is responsible for the telephone system and other systems of telecommunication. They have their own research station and one of the latest developments there is a chemical process for producing piezo-electric crystals. These are employed for the frequency control of radio transmissions. In modern telephone systems over long land-line routes, a number of conversations are concentrated on a single pair of conductors and each conversation occupies a different point of the frequency spectrum. The separation of these conversations is done with the aid of quartz crystal resonators and it is hoped that these artificially produced crystals can be used for this purpose.

The development of Jet Engines and Gas Turbines in this country is under the care of the Ministry of Supply and this body has instituted a bench test to test the endurance of air screw turbine engines, the idea being that these engines are run for 250 hours under conditions that are as nearly as possible those encountered in civil aircraft and if possible without maintenance during that period. The first engine submitted to the test was a Bristol Theseus, which completed its 250 hour test and then it was decided to continue the test, which was carried on for a further period of 250 hours.

An interesting White Paper has been published by the Stationery Office in the form of the first annual report of the Advisory Committee on Scientific Policy. It analyses the number of qualified scientists in the country and says that the output of newly qualified scientists is at a satisfactory level which will meet the demand for 70,000 scientists by 1950, and 90,000 by 1955.

However, one comment on the report makes one wonder whether the situation is so happy. It is pointed out that scientists are being drawn away from the univer-

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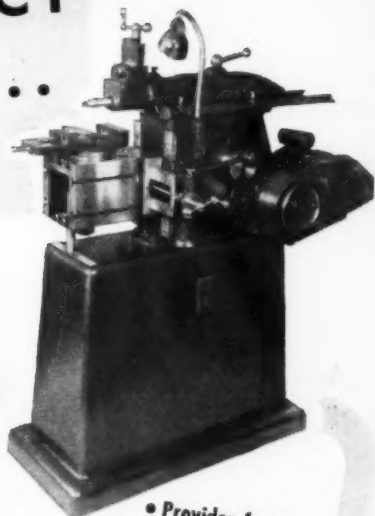
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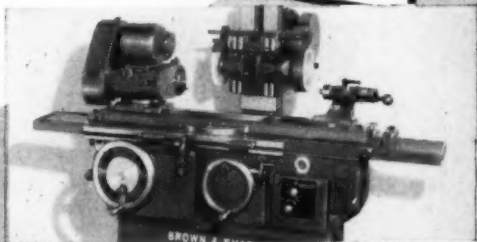
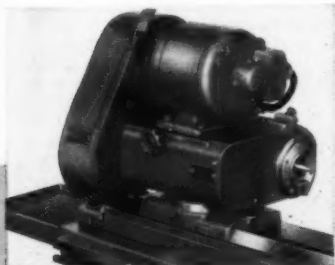
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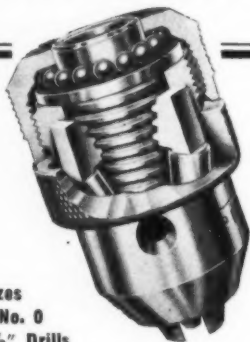
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sities by higher salaries obtainable in industrial concerns. If our universities cannot get sufficient lecturers they will be unable to turn out the number of scientists required. There is a feeling in some quarters that industry is taking an unfair advantage but it may be entirely the fault of the universities. In many of our schools and colleges the remuneration offered to teachers and lecturers is relatively low and the educational authorities would probably get what they wanted if they would pay for it.

There appears to be a fair amount of money in trade unionism if one can judge by the designs submitted in a competition for a new headquarters for the Trade Union Congress memorial building. This will form the new headquarters of the T.U.C. and is to be built in London near the British Museum. The building is to cost £500,000.

Journalists were recently enabled to visit the atomic research station at Harwell. The director of the establishment, Sir John Cockcroft, stated that there are still four major problems to be solved if nuclear power is to become important in the world.

"First, we must solve the so-called breeding problem—we must be able to burn up the greater part of the uranium (the fissile element in the pile) by making the primary fuel U235 breed secondary fuel from U238, or thorium. Secondly, we must solve the metallurgical problem of finding materials which will stand high temperatures and be suitable for use in pile construction. Thirdly, we must develop an efficient way of processing nuclear fuel which has been used in piles. Fourthly, we have to be able to dispose of the large amount of radioactive ash which would be produced by world power stations operating on nuclear fuel."

In a month's time the Machine Tool and Engineering Exhibition opens at Olympia in London. This has been organised by the Machine Tool Trades Association and is the biggest all-engineering exhibition to be held in this country. While, in the main, British machine tools will be featured, there will be a good selection of machines from your own country, Switzerland and elsewhere, and the engineering world is looking forward to this event with con-

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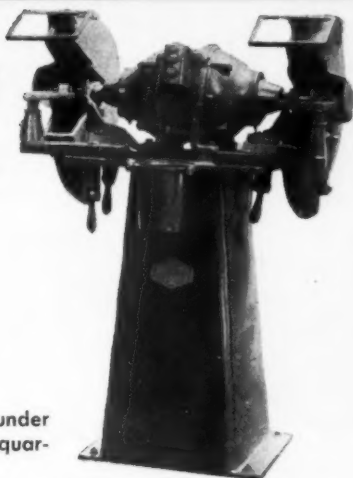
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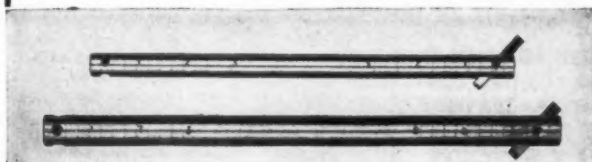
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(Calibrated)
WITH BIT AND WRENCH



Part No.	Size	Length	Price
162A	3/8	7	\$3.50
122A	1/2	8	3.50
123A	9/16	9	3.50
124A	5/8	10	3.50
125A	3/4	11	4.35
126A	15/16	13	6.30

Part No.	Size	Length	Price
127A	1	14	\$ 6.30
128A	1 1/8	16	8.75
129A	1 5/16	18	12.30
130A	1 1/2	23	16.30
176A	1 7/8	30	36.35
155A	2 1/2	36	72.70

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Short Sections of
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siderable interest. Owing to the intervention of the war years it is fourteen years since the last Machine Tool Exhibition and so the progress should be very marked. British machine tool firms have become more industrial-design minded and the appearance of machines will be very much improved. High horse powers and individual drives are the order of the day and many of the machines to be shown will be capable of using cemented carbide tools to full advantage. Electronic controls will be featured on many machines, one of the main uses being for the control of motor speeds to give infinite variation of cutting speeds and feeds.

It is surprising to find that some of our machine tool builders have developed a fashion-show attitude towards the exhibition and are not releasing any details of new designs until the opening of the show. While we can understand the milliner and the dress designer doing this, we are a little at a loss to know just what the machine tool builder will gain from this.

IRON AND STEEL EXPOSITION SEPTEMBER 28 — OCTOBER 1

The forthcoming Iron and Steel Exposition and convention of the Association of Iron and Steel Engineers to be held at Cleveland Public Auditorium, September 28 — October 1, will be one of the most important and informative in the history of the iron and steel industry because of the long lapse caused by the war, A. J. Fisher, association president said in a statement.

The war blanked out the show following the 1941 exposition until the 1946 meeting at which time war developments could be shown. However, true post-war advancements had not yet been translated into practice at that time.

For this reason the forthcoming exposition will really represent most of the technical advancements and improved equipment produced since 1941. The importance of the exposition is further emphasized by the immediate and large demand for display space and interest in attendance. More than 200 exhibitors have already arranged for display space and an attendance of 12,000 or more steel plant officials and suppliers are expected.

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Variable speed range, 120 to 3800 rpm. 9" swing. 1" collet capacity. Collet rack inside of motor compartment door. Independent coolant system (5 gal.) mounted in rear, outside—cleaner, more accessible.

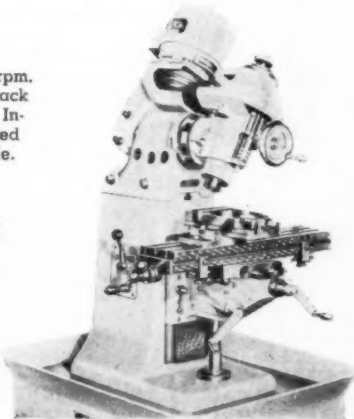
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Preloaded ball bearing spindle. 9/16" collet capacity. Five speeds ranging from 400 to 4000 rpm. Vertical travel of spindle, 1 1/4". Table 4 1/8"x18". 90° swivel each side of center line.

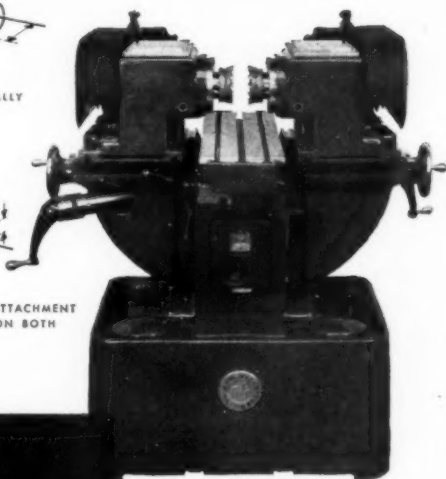
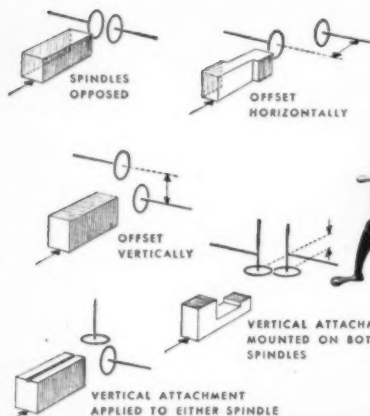
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CONDENSED SPECIFICATIONS

Table, working surface.....	81½" x 30"
Table travel — cutting stroke.....	12"
Motors.....	1725 RPM AC reversible 1 HP
Maximum height center of spindle above table.....	12"
Maximum offset of spindles (horizontal).....	9"
Maximum distance between spindle noses (across table).....	16"
Overall Dimensions.....	4' x 5' x 47"

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NATIONAL DISTRIBUTORS NICHOLS-MORRIS CORP., 50-G CHURCH ST., NEW YORK 7, N.Y.



SELL THE WORLD'S BEST INVESTMENT



by J. C. Hebert,

Sales Manager, Jones & Lamson Machine Co.

Selling techniques have not kept pace with technological developments. A formula must be found to compute earnings possible with new machine tools. Profits can be improved through the use of new tools.

WITH THE rapid strides that have been made in the productivity of machine tools and manufacturing processes, our industry is confronted with the necessity of doing a more aggressive engineering and educational type of selling.

To a great extent we are still using the same selling approach and technique that we have used in the past, but I believe we are not going far enough.

What are we doing to give our customers the information they require to visualize the earnings available for them through the purchase of new machine tools? In most cases in the sale of standard machine tools, where the machines are sold with standard equipment, we are approaching the problem in the same old way. We receive an inquiry direct from our customer, or through our field man or dealers. We quote on the machine and equipment, and our field men do an excellent technical job of presenting our proposal, to the operating personnel, and explaining all of the advantages of the new features and the new machines we are offering. So far so good, but what about management?

The operating personnel in the customer's plant is, in most cases, very much impressed with what we have to offer, but only in a very few cases are we going far enough to assist the operating personnel in presenting their requests to management, and to provide the operating personnel with information that will enable them to present our proposals to management, clearly indicating the potential earnings per dollar invested in the equipment we are proposing.

In the sale of production machine tools and the sale of special machines we are doing a better job as an industry. We very carefully work out unique arrangements of tooling and go to much expense in taking the last split second out of the time required for an individual operation. We supply the buyers of this type of equipment with information and knowledge that enables them to make an accurate analysis of machine tools purchases. However, in

most cases, from this point on we leave our fate as to whether or not we get an order, entirely in the hands of the operating personnel whom our men have contacted.

While we have sold the operating personnel on the use of new machine tools, they in turn, have not done a good job of selling their own organization.

In a large percentage of cases the operating personnel are not doing a good job of selling within their own organization. These men are not presenting our case to management in terms of dollars and cents, (potential earnings) so management will appropriate the funds required to purchase new equipment. I am convinced we must prepare ourselves to do a more thorough job of analyzing the customer's requirements, so we can offer him equipment that will show sufficient earnings in a given period of

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18"	— 350.00 Extra Heavy Duty
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time to justify the purchase of new machines.

If we expect to increase machine tool sales, we must go all the way and do a high grade educational, engineering type of selling, and in addition furnish our customers with sufficient information and knowledge so they can readily determine the potential earnings per dollar invested.

A formula is needed to efficiently estimate earnings which are possible with new machine tools.

I would like to see a formula worked out, based on fundamentals that can be justly taken into consideration when figuring earnings made possible by every dollar invested in new machine tools. This formula should be based on not more than four or five of the most important factors that can be readily obtained, without delving into the cus-

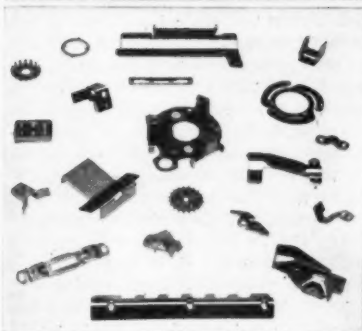
tomers' books.

One may feel that this is too much of a burden, but I do not think it is. We are already doing just this in the sale of high production machinery and special machines. When selling a machine with a universal set of tooling, by studying four or five jobs that are typical of the work that is to be produced on the machine, we can develop a ratio that can be used in figuring the earnings on the new machine.

Most manufacturers' representatives in the field are able to make production estimates sufficient to develop the basic information required for this calculation. There is no investment in the world today, that I know of, that will show the earnings per dollar invested that we can show to our customers with the machines we are offering.

In this connection, the N.M.T.B. Association, through its Sales and Service Committee, has arranged a Sales Re-

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fresher Course at Cornell University.* In this course we have tried to work up a curriculum that will cover the four fundamentals of selling machine tools; namely the origination of an inquiry, the selection of the proper equipment to be quoted, the presentation and the economic analysis of the purchase of machine tools.

We recently had a report on a Thread Grinder where the customer earned 80% on the investment the first year, and in practically every case a new machine tool will earn from 35 to 100% on the investment. With these facts, we should be able to go out and sell machine tools based on the potential earnings per dollar invested.

If we can develop a sales technique, and furnish our field men sufficient information so they can properly present the picture to our customers there is no reason why we cannot increase our sales. A large percentage of the machine tool builders have made surveys of customers' plants, and have worked out various plans for justifying the purchase of new machine tools. Most of these surveys are very expensive, require a lot of time and materially increase sales costs.

A simple formula of earning capacity is difficult to formulate. Too many factors must be considered. Some of our larger corporations have developed workable formulas for computing earnings.

We, as a company, have approached our auditors and other financial people regarding a simple formula that can be used universally, one the average operating personnel in our customers' shops can use in figuring the potential earnings per dollar invested in the machines we are offering. We have not

come up with anything we think is workable, or satisfactory, to date. There are many factors to be considered in determining the savings effected by the purchase of new machine tools. We can readily calculate savings that can be made through the increased production of the new equipment we are offering. We can readily estimate the value of the displaced equipment, but there are many other considerations, such as light, heat, power, paid vacations, social security, floor space, and supervision, all entering into the savings that can be made through the installation of new machines. Where to draw the line and develop a formula that will be accepted by industry is the problem. I am confident that if we were to develop a formula that was approved by the large nationally known auditing firms, we could work out one that would be accepted. Most of the large corporations like General Motors, Chrysler and companies of this type have their own formulas for figuring earnings per dollar invested in new machines.

What I am thinking about is a formula which can be used by small and medium sized manufacturers, so they can approach the buying of machine tools on an economic basis with a full knowledge of all the factors involved. In most cases in the small shops the superintendents or master mechanics take our quotations to top management, and tell them they want to buy this machine; that they need it because the existing equipment will no longer cover their requirements. We cannot sit back and content ourselves with the replacement of worn out and obsolete machine tools, if we expect to increase our machine tool sales. We must replace machine tools in our customers' shops before they have reached a point where

***In another section of this month's issue of the MACHINE and TOOL BLUE BOOK you will find the first of these Sales Refresher Course lectures. The editors hope to present the complete course during the months ahead. One or two lectures of the course will appear in each issue of the MACHINE and TOOL BLUE BOOK.**

An Important Announcement From The FORD MOTOR COMPANY

Since 1923, we have manufactured and distributed the world-famous Johansson Blocks.

We now have completed negotiations for the sale of the Johansson Gage Division of the Ford Motor Company to Brown & Sharpe Manufacturing Company of Providence, R. I. Before this transaction was completed, we gave very careful consideration to the problem of finding a company with the skill and experience that would assure continued production of Johansson Blocks to the Johansson standards of quality.

The Brown & Sharpe Manufacturing Company has 115 years of experience in the making of precision tools, and after careful study, we decided that this experience, coupled with their standing in American industry have made them the sound choice to take over the manufacture of these precision gages.

All patents, methods and machines required for making Johansson Blocks become the property of Brown & Sharpe. Machinery and special steel stocks are being moved to Providence.

Meantime we will continue to provide Johansson Blocks from available finished stock here at Ford until Brown & Sharpe are in operation and ready to supply them.



FORD MOTOR COMPANY

they are worn out, and will no longer serve their purpose.

There are plenty of machine tools in our customers' plants less than ten years old that can be replaced today with new machine tools, and the total investment be written off in savings in less than three years. Years ago we figured \$2000.00 a year for a machine operator. Today we have to figure at least \$3000.00. If we can only double the customer's output through the installation of a new machine that costs approximately \$9,000.00, we can write off the investment in direct labor savings alone in three years. In many cases we can show our customers three or four times the production they are now obtaining per labor hour, through the installation of modern machine tools.

American business' profit position can be improved only through reduction of high taxes, high labor and material costs.

We hear a lot about American Corporation profits of \$17,000,000,000 in 1947. The aggregate corporate business for the year 1947 was about \$300,000,000,000.00 so on this volume of business the profit margin was approximately 5½%. Industry is saddled with high taxes, material and labor costs, and the only way American industry can expect to improve its profit position is

through reductions in these major cost items.

Some of these items are beyond our immediate control, but an improved and more aggressive sales approach is within our control. Machine tools form our basic industry, and if we can assist our customers in reducing labor costs, it will result in savings in material and in fabrication of the finished product.

Our Federal Reserve Banks have instructed all member banks to tighten up on speculative loans. We know money is tighter and interest rates are higher. The political situation throughout the world is in a deplorable condition. All of these uncertainties enter into top management's decisions when making capital expenditures.

We have these hazards to overcome in the sale of capital goods, and, we must do something about it. As an industry I do not think we have started to sell machine tools from the economic point of view. We will not achieve maximum results from our efforts until we are able to convince the bankers and top management that there is no other investment in the world that will pay as high a percentage of return as can be obtained through the purchase of modern machine tools.

I am confident most of us are constantly receiving reports from field men and dealers stating they have sold products to the operating personnel, but

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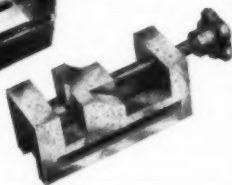
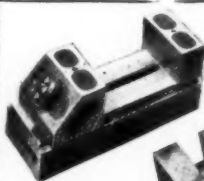


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they will not be able to secure an order until the appropriation has been granted. What we want to do is get our hands onto that order, and we must cooperate with the operating personnel and provide top management with technical and economic data that will justify the investment in the machine tools we are recommending.

Our industry spent between 3 and 4 million dollars for the Chicago Show. We all received many congratulations for the fine job we did, but by far the largest percentage of the attendance was technical people. We have all received many inquiries as a result of the exhibit, but we have not received a volume of business in keeping with the enthusiastic reception of the products we exhibited. This is another illustration that we can sell our products to the technical minds and the operating personnel, but the real essence of getting an order today is to sell top man-

agement and the people holding the purse strings.

We had an order recently for a machine which was cancelled the day after we received it. The report came in that this particular company had borrowed money from a bank, and the bank had definitely stated the money was to be used for operating expenses only, and could not be used for capital expenditures.

We must spend as much time and energy selling our products as we do perfecting them.

I realize the task we have ahead of us is not an easy one, but if we spend as much time and energy in applying ingenuity to the sale of our products as we do in the development of our equipment, we will materially increase the sale of the products manufactured by our industry.

Our approach to selling the financial mind on a mass production basis is a new challenge for us, but I am convinced that if we apply ourselves and use the ability we have in our industry we can sell the world's best investment. THE END.

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U. S. STEEL SUPPLY CO. OPENS SAN FRANCISCO WAREHOUSE

The opening of a large modern steel warehouse and facilities in San Francisco, was announced by Leslie B. Worthington, president of United States Steel Supply Co., warehousing subsidiary of United States Steel Corp.

The new warehouse, the company's 11th, follows the opening of a new one in Los Angeles less than a year ago. Clifford W. Lord, manager of West coast operations, said the new warehouse will carry complete stocks of steel, steel products, tools and equipment. The building, a modern steel structure over paved flooring occupies an area of 260,016 square feet. It is scientifically planned to speed zoning and loading of steel for shipment. Frank B. Stewart is the local plant manager.

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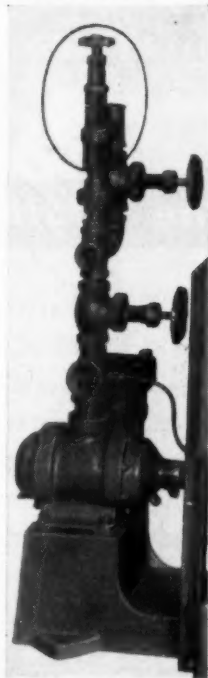
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Photo shows Fulflo relief valves in oil spray systems built by The Brown-Fayro Co., Johnstown, Pa.



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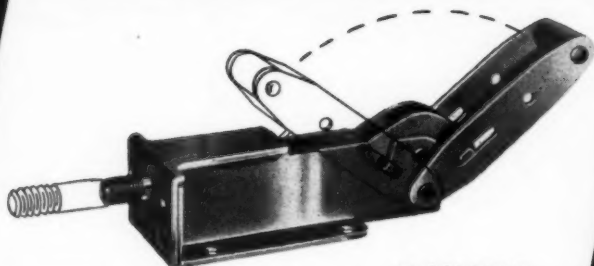


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Lecture No. 1
A SURVEY OF MACHINE TOOL BUYERS

by

Herbert L. Tigges

Executive Vice President and Sales Manager
Bakers Brothers, Inc.

**WHAT DO OUR CUSTOMERS
THINK OF OUR SALESMEN?**

Through the use of a questionnaire, mailed to buyers representing a cross section of industries, some valuable information has come to light regarding sales methods of the machine tool industry. The questionnaire and an analysis of the answers are presented by the author.

The MACHINE and TOOL BLUE BOOK is happy to present to its readers the complete lectures delivered at the Sales Refresher Course at Cornell University, July, 1948. The course was sponsored jointly by the National Machine Tool Builders' Association and the American Machine Tool Distributors' Association. While lectures deal primarily with the selling of machine tools the fundamental sales principles can be adopted profitably by the manufacturers of general industrial products. The editors thank the NMTBA, the AMTDA and Cornell University for their cooperation in making this material available to their readers.

THE CAPACITY of the machine tool industry was built up to meet the demands of the last world war. This was done under war-time conditions, when it was not a matter of selling, but of taking orders. The great problem was to produce. After the war, under the conditions surrounding our industry at that time, such as the sale of surplus war machines, it became evident that we in sales were presented with a real problem of selling the capacities of our plants. An indication of this problem of selling the increased capacities of machine tool plants is well brought out by statistics from our association office. We have today an industry whose capacity measured in dollars means yearly sales of \$600,000,000 if we sell our entire capacity. However, in the year 1947, and for the first months of this year, reports indicate that only 50% of our capacity is being used. Our sales organizations in the past have done a good job of securing orders to keep our plants operating. Today, however, due to different world conditions as well as our many local problems, it becomes evident that we must do an even better job of selling and we must do it by training our sales organizations to meet the conditions of today. Our sales representatives in the field, who contact the customers and speak for our companies, should be well-informed, with proper tools in their sales kit.

Today, as in the days gone by, we cannot just sit back and wait for inquiries. Our sales forces must be out in the field doing creative selling work. I am sure that our customers will welcome this creative selling, and their engineers will be glad to cooperate with our sales engineers in solving their problems of production. While we are solving the problem, we will be on our way to selling the world's best investment — machine tools.

I feel it is very fitting that we examine ourselves, which we can best do not from our own viewpoint, but from the viewpoint of our customer. It seemed evident to me that customer reaction to our selling would be very valuable and help us to improve our sales methods. I accordingly prepared a Machine Tool Sales Survey Questionnaire. It, of course, was impossible to distribute this questionnaire to all buyers of machine tools in the country, but in mailing them to a cross-section of buyers from various industries, I feel sure that we have secured a fairly accurate report. Answers were received from machine tool buyers of New York, Ohio, Indiana, Illinois and Michigan.

Although I only received about a 60% return, those who did cooperate brought out some very interesting information and constructive comments. You can well appreciate that it was not possible to prepare a questionnaire which would present all questions and cover our subject completely, but the questions asked are, I feel sure, of basic importance, and our customers' answers give us some good points to consider.

In preparing the questionnaire, I approached the subject under three headings: First, pertaining to origination of inquiry; second, presentation of proposal; and last, a rating by the customer of our selling technique.

Before giving customers' comments, let us make a study of answers to the various questions. In making my summary of answers, which you will find in the right-hand columns, I have used percentage figures. As an example, to question No. 1A, 69% of the returns answer "Yes," and 31% answer "No." In connection with this question, it is interesting to study the next one, (b). All of the customers consulted expressed their willingness to have the salesman know their product and methods.

On the next question, 1 (c), you will note that by far the majority of our salesmen appreciate the value of knowing the customers' products and his methods of machining. This is indeed gratifying, as with this information our representatives are in good position to make recommendations on equipment which will better the customer's methods, give him a better product, and yield other returns which are important to the customer from the standpoint of the return of his investment in new equipment.

Our next question might be somewhat controversial as far as our customers are concerned, as customer reaction might be to the effect that when they issue an inquiry for a definite size machine, they themselves know the size and type of machine best suited to do their work. The answers received to this question, however, indicate that customers are willing to have our representatives make this investigation. The replies definitely answer the question: 58% find that our representatives do investigate the work to determine whether the machine the customer has specified is best suited to it. I personally feel that this question is very important, not only applying to standard general-purpose machine tools, but also to the specialized high-production machines. From the customer's standpoint, when he specifies a certain size

MACHINE TOOL SURVEY QUESTIONNAIRE

Pertaining to Machine Tool Industry Selling

NOTE: Figures given in "Yes" and "No" columns are percentage of total returns. No. 1—Pertaining to origination of inquiry.

	Yes	No
a)-Do our sales representatives suggest machines which will prove of good investment over your present equipment?	69	31
b)-Above question indicates salesman knows your product, and your methods of machining. Are you willing to have salesmen have this information?	100	0
c)-Do majority of salesmen take advantage of your cooperation if answer to question (b) is "Yes"?	96	4
d)-When you issue inquiries not originated by salesman, do majority investigate your work, to determine whether machine you specify is best suited to your work?	58	42
e)-When salesman calls, and you give him inquiry, is he thorough in securing information?	98	12
Do they ask permission to go into Shop to see work?	88	12
f)-Return calls for further information to allow for quoting takes your time, do most salesmen get all information on the first call.....30..... second call.....54..... third call or more.....16.....		

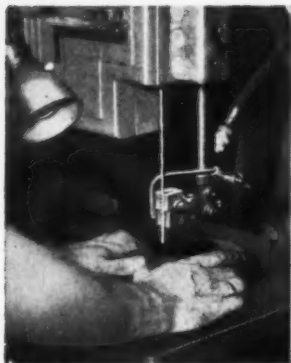
lathe for his requirements, it is always possible that his work does not require the machine he specifies. Possibly a machine of less capacity would handle his work, with of course also the possibility that production is such that a different type of lathe would be best suited. When customers issue an inquiry for special multi-operation machines to suit their own process, there is always the possibility that one of our engineers can, for the customer's required output, better the process and combine on one machine operations originally specified for two machines, thereby saving one handling and one operator.

The next two questions, letters (e) and (f), tie closely together. Again it is gratifying to note the answers to these two questions. Answers indicate that our field men are thorough in securing information pertaining to an inquiry to be embodied in a proposal of the best possible recommendation for the customer's problem. You will note that 88% of the returns replied in the affirmative; that is, our customers say that our representatives are thorough in securing information. The second part of the question ties very closely to the first part of the question, and it is interesting to note that our representatives in the field have an appreciation of the importance of getting into the customer's shop to see his work.

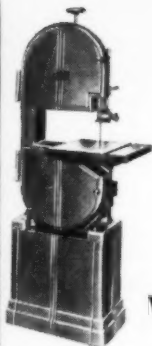
From our own experience in the preparation of proposals, to give customer the best recommendation for his require-

ments, I find the next question very important. I feel sure that by far the big percentage of our factory sales engineering departments experience considerable difficulty in securing sufficient information with the original inquiry to allow for proper analysis and recommendation of the best method and machine. If sufficient information is not received with the original inquiry after the salesman's first call, not only is more time taken by the customer, but time is lost in making prompt delivery of the proposal. This, I feel, is most serious from the standpoint of taking the time of a busy customer, as well as the possibility of delay in presenting the proposal, to such a degree that the customer may have been sold by a competitor before the proposal is submitted. You will note that the answers indicate that 30% of our friends find that the salesman secures all the information necessary on the first call; 54% of the returns indicate that a second call is required, and 16% a third call. In analyzing the answers to this question, we must be fair with our representative, as inquiries at times are very complicated, and the customer may make changes after submitting the original inquiry.

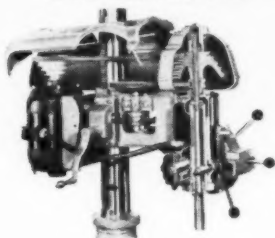
The number of calls was very well covered by one large buyer for high-production machine tools. I quote his comment as follows: "The type of equipment being ordered may require return calls. Most of the equipment ordered by us at present is designed to suit our



Model MBN-935 Price: less base and motor \$187.00**

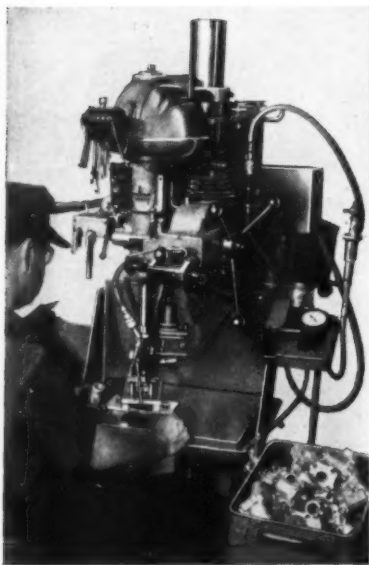


Model D-1101X Price: less motor and column \$216.00*



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The *power feed* feature of these drill presses enabled Wahlund to design an air-operated set-up which automatically starts the spindle, clamps the work and expels the coolant. Results are increased production with lower man-hour costs.

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**MACHINE
TOOLS**

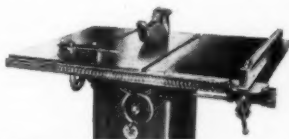
DRILL PRESSES—HAND AND POWER FEED • RADIAL DRILLS
RADIAL SAWS • BAND SAWS—FOR WOOD OR METAL
RADIAL METAL CUT-OFF MACHINES • MOTORS

Photo, left: Wahlund's set-up on standard 20" Walker-Turner Power Feed Drill Press. Here shown machining castings for tractor umbrella.

**Photo, above right:* 20" Power Feed Drill Head, Model D-1101X. 4 ball bearings, 6" spindle travel. Five standard spindle speeds, 400 to 2600 r.p.m. with 1740 r.p.m. motor. Capacity 1" in cast iron, 3/4" in steel. Slo-speed motor optional.

Photo, above left: Operator using Walker-Turner 14" Band Saw to cut steel for dies. At Wahlund's this band saw also cuts materials for jigs, tools and other parts.

***Photo, above center:* 14" Metal Cutting Band Saw, Model MBN-935. Blade speeds from 61 to 4630 F.P.M. Weight, less base and motor, 350 lbs.



10" Tilting Arbor Saw, TA-1180 B. Cuts to depth of 3", angle cuts to 45°, accurate miter gage. Price: less motor, switch, extension tables, guard and splitter, \$150.00.

particular needs and conditions. This usually occasions many calls. Oftentimes the salesman brings the engineer from the machine tool plant to study the problem. If this condition exists, the number of calls may vary from one or two calls to fifteen or twenty, depending on the type of equipment under consideration. In the development of one of our recently procured special high-production machines, I believe that as many as twenty calls were made in connection with the purchase. The supplier company sent their engineers to visit our plant to review progress, make suggestions, watch tryouts, etc."

I well appreciate this comment pertaining to specialized machine tools. However, I do feel it was necessary for the supplier in this instance to make at least a preliminary original recommendation and proposal. To arrive at the best equipment to solve the customer's problem the engineers at the factory on receiving the original inquiry felt the need of a very complete picture of the customer's work. On special machines, we all experience the necessity of sending our factory engineers with the salesman to discuss engineering detail. These calls are made at time inquiry is received, as well as by engineers from the factory after the proposal is submitted. If the equipment is ordered, it is understood that any number of contacts will be made by factory engineers in connection with the design of special fixtures, tools, and equipment.

Our purpose must be to save the time of our customer and to submit a proposal promptly.

There is basic information that we all need to make a recommendation on the best machine. Any number of items can be mentioned, such as production requirements, material, where the material is to be machined (a factor of great importance), and the limits to be met. We are all called on to estimate production, and to make fairly accurate estimates, and we must know materials to allow for setting speeds and feeds. This is particularly difficult on many steel alloys. In connection with this matter I think our field men either should have fixed questions in their minds to ask to secure very complete information on the first call, or should use prepared inquiry questionnaires, which many machine tool builders provide for their salesmen. I feel sure that you will agree that since 70% of these answers indicate the need for two or more calls, we should give this very serious thought, and our sales rep-

resentatives must do their best to be more thorough in securing as complete information as possible on the original call when an inquiry has been received.

Any number of additional questions could have been asked pertaining to the origination of any inquiry, but I feel that the questions stated are fundamental and indicate the need for making a very careful examination of our own sales organization.

The second part of our questionnaire applies to the presentation of proposals. Question (a) under subdivision 2, indicates that our salesmen not only are acquainted with the inquiry itself, but have studied the proposals. The 88% affirmative answers indicate that our salesmen are doing a good job in explaining the proposal to the customer. This question is very important, as a discussion based on a thorough knowledge of the proposal indicates that the salesman is really doing a job of selling, assuming of course that our representatives use the right sales psychology, and have been properly picked for the selling assignment. With a combination of sales ability, and a thorough knowledge of the proposal, you have a combination which should lead to taking the order.

In approaching the next question, 2 (b), I call your attention again to the fact that this survey is based on a limited number of returns and does not prove that the majority of our sales organizations follow the procedure which the returns indicate. I feel sure that you all agree that the salesman should be well informed in what he is offering and he should make his explanation and do his selling prior to presenting the formal proposal to the customer for reading. This does not mean that the proposal should not be used as a reference during the conversation — 77% of those answering this question say that the salesman first hands the customer the proposal to read. I appreciate the fact that there can be a difference of opinion on this question, as there may be reasons why the proposal is first presented to the customer. The time of the man interviewed might be limited, for instance, or other factors might enter into the picture. As a general procedure I question its wisdom. The question of the presentation of the proposal will no doubt be covered during this course, with opportunities for further discussion. Our sales experiences differ, depending on conditions, and on this question I can only indicate my personal opinion, with answers from the returns as to the per-

No. 2-Presentation of Proposal.

No. 2-Presentation of Proposal.		Yes	No
a)-Are salesmen well informed on their proposals, to allow for concise explanations and answers to your questions?		88	12
b)-Is it the usual procedure for salesman first to hand you proposal for your perusal?		77	—
Or, does he explain the recommendation with discussion and answers, and then give you the proposal for later study.		23	—
c)-What is your preference on delivery of proposals:			
1-Mail, to allow for study and then call by salesman?		40	—
2-Personal presentation by a salesman?		60	—
d)-Do our proposals give you sufficient information?		42	58
Do you find it necessary in the majority of instances to ask for more information?		45	55
If answer to previous question is "Yes", please comment briefly on the information which is lacking.			
e)-Do you prefer proposals covered by letter form?		16	
Or, proposal forms with proper item headings and made in sequence of importance of information.		84	
f)-Do our sales representatives give you information on dollar return on your investment?		8	92
NOTE: This can be done by our industry through your cooperation. To really do a thorough job from all angles of return, our engineers need information from you, such as your present maintenance cost, if old machine is being replaced, as well as present depreciated value of old machine, cutting tool costs, present prod., etc. Does policy of your company allow for giving out this information? (Answers rec'd. on only 50% of returns)		50	50
Machine tools are a capital investment. We know you buy for a dollar return with increased output, more accuracy of product, how can we best give you this service? A brief comment will be appreciated.			
g)-Do our salesmen and our proposals and literature give you sufficient information to present and sell your management or Board of Directors.		86	14
Rate our present selling based on your contacts, thinking in terms of majority of salesmen, both Dealer, Factory, Direct Salesmen as well as Sales Engineers from factories (use previous questions) as well as your own impressions of their selling ability as yardstick.			
100 indicates very good — Mark X after rating.			
a-100	18	d- 50	0
b- 90	27	e- 40	0
c- 75	55	f- 25	0

centages using the two procedures.

Questions 2 (c) and 2 (d) were submitted to secure information from our customers to allow for giving better service in connection with the proposals, as well as giving sufficient information in proposals; 40% of the answers indicate a preference for having the proposal sent by mail to allow time for study, followed by a call by the sales representative; 60% of the returns, however, indicated their preference for a personal presentation by salesman. In the absence of general agreement on this question, it is evident that our salesman should follow the procedure suited to the individual case.

I am sure that in connection with the next question, 2 (d), we are all doing our very best to improve our proposals and to make them more comprehensive, with not only complete specifications on the equipment offered, but detailed time study sheets, processes, layouts, together with sales features of our machines. The answers to this question indicate about the same percentages on each question; that is, 58% indicate insufficient information and 45% indicate that in the majority of instances it is necessary to ask for more information.

As I feel that these two questions rate high in importance, customer comment

was asked for. I may quote these comments from a few of the returns: "Many proposals lack sketches, which are more descriptive than words. Details on electrical equipment and control are frequently lacking."

The following comment is very charitable: "There is none of us so smart that every factor unveils itself to us without a very comprehensive study." Another comments as follows: "We get insufficient information with proposals, such as spindle sizes, types of bearings, general dimensions, delivery, weight, etc. Price breakdown not in fine enough detail." This customer evidently feels that he should have information on detailed specifications of the design of the machine. However, I do not feel that this is general in the trade, as most buyers feel that our engineers are qualified to furnish the proper proportions in parts such as bearings, spindles, and so on.

One of our customers commented in detail on the various questions of our sales survey questionnaire. His comment is not only interesting, but constructive. As an answer to our last question, I quote his comment as follows: "The average proposal submitted is rarely accepted. As a rule, it is not prepared to our fullest satisfaction. Our accounting

setup requires a breakdown of the costs to be made in a certain manner. It also specifies that motors and other electrical equipment be specified in separate items, and our electrical department also specifies certain makes of motors and electrical equipment. In the majority of cases one or more of these items are overlooked, requiring a rewrite or correction of the original proposal. Another point that is very often overlooked is the number of copies of the proposal forwarded to us. We either have to call upon the salesman for additional copies, or type them ourselves."

In discussing the proposal and my survey with other machine tool builders, I find that some submit their propositions on their regular letterhead, whereas others use a proposal form. As a result, question 2 (e) was asked. You will note from the replies that only 16% preferred letter form quotations, whereas 84% of the returns indicated their preference of proposal forms, with proper item heads made in sequence of importance of information. On one return, the customer definitely indicated proper arrangement of proposal, without commitment as to whether proposal should be made on letterhead or proposal form. I quote this customer's comment as follows: "We prefer proposal with proper item heads, made in sequence of importance of information, and under prices we require breakdown of prices on the various items in accordance with our accounting department requirements."

Question 2 (f) asks whether we are giving the buyer information on the earnings on his proposed investment. Machine tools are bought as an investment, and the computation of the returns on the investment naturally indicates whether the proposition is a good investment from the user's standpoint. Accordingly, this question is of prime importance. Your Sales and Service Committees, both of the Builders' and of the Distributors' Association, have been giving this subject very serious consideration. Many discussions have been held and many suggestions have been offered by members at our various meetings. You will hear more on this subject during this course; accordingly, I will not make further explanation. I know you all appreciate the value of this kind of selling, and there are no doubt any number of questions in your minds as to how to compute the returns on the investment on machine tools. If my Gallup poll with returns received gives the answer of our

(Turn to next page, please.)

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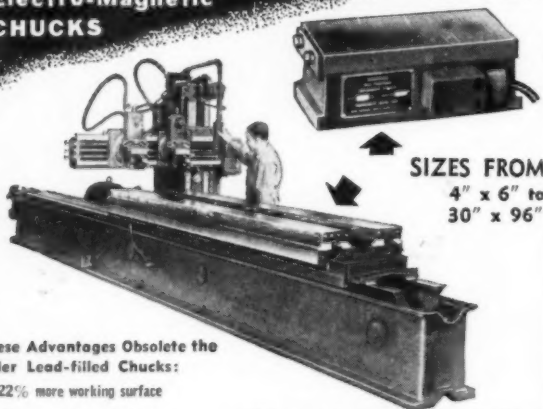


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trade, it becomes very evident that we have not done too much of this type of selling. Note that 8% of the returns answered "Yes" while 92% answered "No." In our approach to this constructive sales procedure, I feel that comments made by some of the contributors would be interesting and helpful.

For instance, one answer is as follows: "We seldom give out complete information." This comment indicates that the company policy is not receptive to giving out the information necessary to compute the earnings. However, in an-

swer to the latter part of question 2 (f) we find that 50% of those who answered the latter part of this question are willing to give out information.

I quote one additional comment, as follows: "In some cases, the sales representative uses the dollar rate as the basis of sale. As a rule, the possible saving is unknown to the salesman, and he is not fully conversant with plant conditions. We, however, through our engineering and time-study departments make a thorough check as to the possible savings, and from this information determine our amortization period. If the equipment being purchased will amortize itself within a reasonable length of time, we then give it consideration. It is not the policy of our company to give out information in regard to cost, and hence, the sales representative works blindly in trying to make

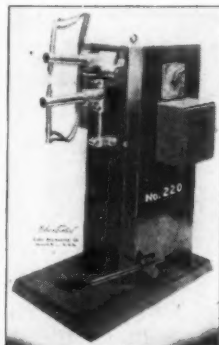
a sale on the basis of savings."

In the majority of instances it is necessary for the master mechanic, superintendent, factory manager, or the individual who interviews salesman, to have sufficient information to sell the executives of the company, or Board of Directors, to secure an appropriation to cover the purchase. Information that we can furnish, not only during personal calls, but in our proposal and literature, may fortify the buyer to sell his own management. The replies received to

(Turn to next page, please.)

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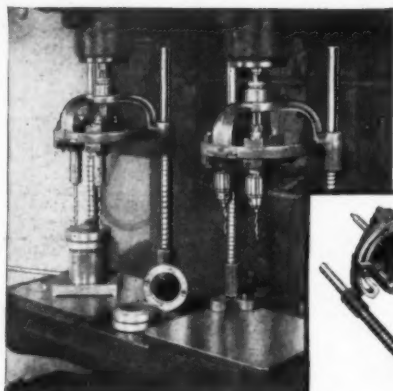
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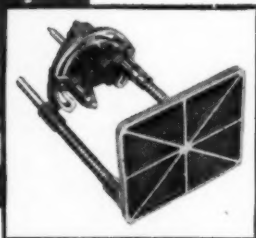
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question 2 (g) are very favorable to our sales organizations; 86% of the returns answered this question "Yes" with 14 answering "No." Before commenting on the returns rating our selling, I would like to give briefly additional comments and suggestions made on some of the returns.

One customer who rated our selling at 75, comments as follows: "It is very difficult to answer the above questions with a straight 'yes' or 'no.' I find that salesmen vary considerably in the degree of their knowledge about the product they

are selling. One of our greatest difficulties lies in obtaining accurate data on machine tool deliveries. This is apparently due to unreliable information given the salesman by his factory. It is also my opinion that the machine tool industry could improve their engineering service considerably if their engineers spent more time with their customer, in review of their equipment after it is in operation."

In preparing this questionnaire, I appreciated the difficulty of answering these questions with a straight "yes" or "no." The questions were intended to allow for answers based on experience with the majority of salesmen who call on that customer. Accurate information on deliveries is of course the responsibility of the factory. I feel that the last sentence of the above comment is also important, as it indicates that after the machine

is in the customer's plant, we must give service and follow up the performance of the machine. This "follow-through" is very helpful to furthering the sale of additional machines.

Another customer makes the following comment: "I feel that the day of the salesman is over. The new name 'sales engineer' is descriptive of the man needed, with enough experience and training to put himself in the customer's place, and realize what the requirements are. Our biggest criticism is that he creates the

(Turn to next page, please.)

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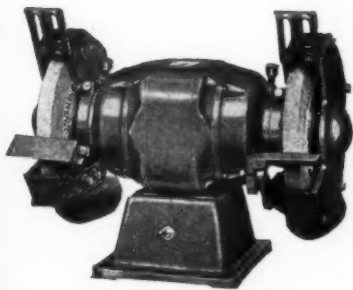


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impression that his job is done when the order is received."

This comment is very interesting, and I feel sure is shared in by those of us who are actually engaged in selling and who realize that our job is a combination of selling and engineering. We in sales are "sales engineers"; however, we are still, in the true sense of the word, salesmen of the industry. In making this survey, I have accordingly used the term "salesman," though I appreciate the background of engineering required.

In concluding my report on this sur-

veys from a limited number of buyers, but of companies having a high standing in their industries. THE END.

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vey, I call your attention to the rating of our selling methods as indicated by my contributors. This rating indicates that we are giving service to customers and doing a real selling job. Note that 18% of the returns rate our selling as very good, 27% give a rating of 90, and 55% give a rating of 75.

It is indeed gratifying to note that in no case did I get a return rating our selling under 75. Our aim in the industry sales department should be one of raising our rating, with all of us shooting at the grade of 100. Your Sales and Service Committees are very anxious to be helpful to our industry's sales promotion, and hope that at the end of this Sales Refresher Course you will all take home with you suggestions and aids to your sales activities.

In conclusion, let me suggest that in weighing the results of this survey it is based on re-

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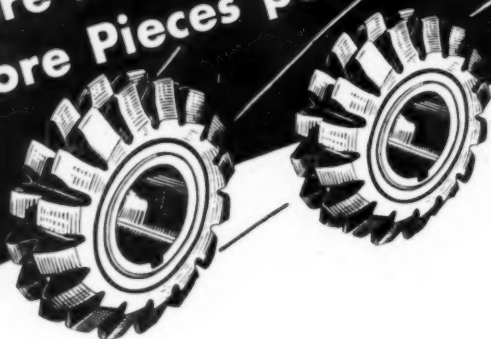
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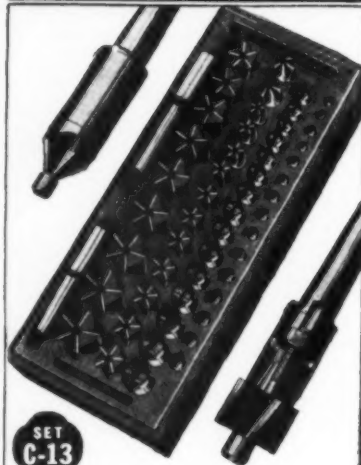
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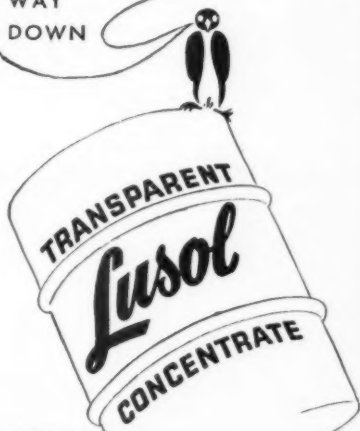
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Comparative drawings show common construction in contrast to new design features. Advantages to obtain wear resistance. Describes latest models in single, double and triple reductions and for use in combination with Varidrive units. Motors presented in natural color. 16 pages. U. S. Electrical Motors, Inc., Dept. BB, 200 E. Slauson Ave., Los Angeles 54, Calif.

SOCKET SCREWS

Engineering data, correct applications, illustrations and list of types available . . . sizes, dimensions, prices, shipping weight, specifications. Catalog discusses socket set, cap screws, stripper bolt, pipe plugs. 36 pages. Bristol Co. Dept. BB, Waterbury 91, Conn.

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Complete specifications, sizes, dimensions, prices of reamers, fluted chucking, adjustable chucking, shell reamers. 4 pages. Pratt & Whitney. Dept. BB, West Hartford 1, Conn.

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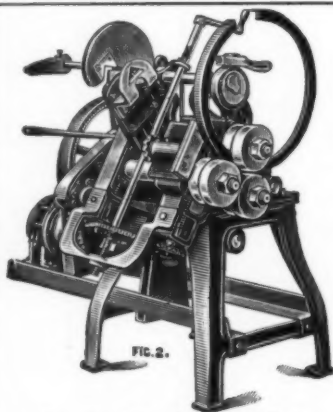
Heavy Duty. Description of features of design and construction which gives "Five-Point Performance." Specifications, dimensions and weights, typical foundation plan and cross-section views of crowning and concaving device. Design features, installation views and close-ups illustrated. No. 115. 28 pages. Farrel-Birmingham Co., Inc., Dept. BB, Ansonia, Conn.

HEAVY DUTY, MOTORIZED SPINDLES

Information for quick selection of right heavy duty, precision, motorized spindles, matching wheel holder, or cutter head. Specifications, hints on installation. All spindles equipped with sealed-in lubrication. 64 pages. Pope Machinery Corp., Dept. BB, Haverhill, Mass.

MULTI-RANGE ARC WELDER

Descriptions, illustrations of three models. Applications in various industries illustrated. 4 pages. Hobart Brothers, Inc. Dept. BB, Troy, Ohio.



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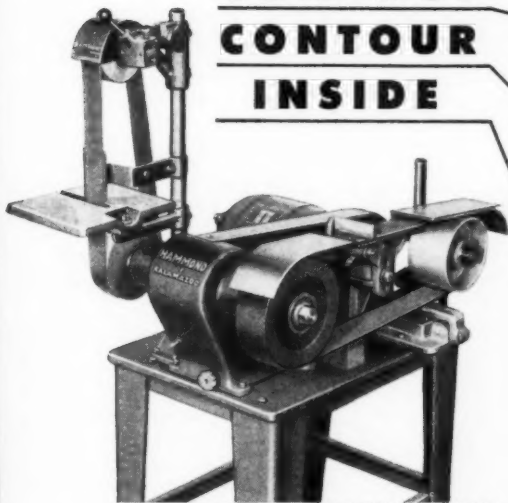
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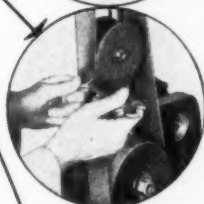
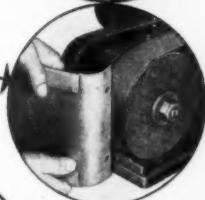
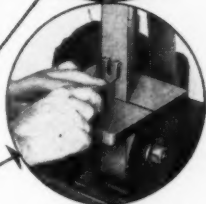
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N. F. P. A. HANDBOOK OF FIRE PROTECTION

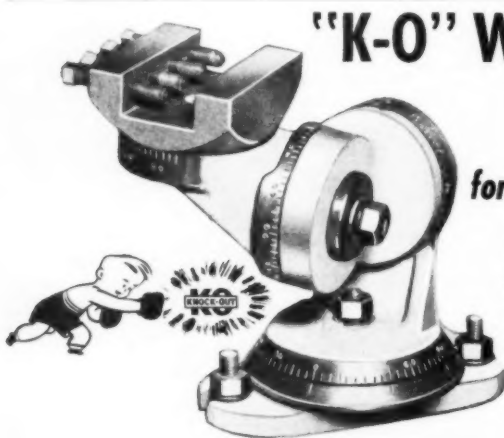
By Everett U. Crosby, Henry A. Fiske, Walter H. Forster, authors of original editions. Robert S. Moulton, Editor. Technical Secretary, N.F.P.A. National Fire Protection Association (International) 60 Batterymarch St., Boston, Mass. 1948. Tenth Edition. 1544 plus xxiv pages.

The up-to-date edition of this well-known handbook is a complete revision of the ninth edition, published in 1941, with detailed treatment of the numerous new developments in the fire protection field during the past five years, and revision of all obsolete data,

according to the editor's foreword. The book "aims to provide, in compact form, the essential information on fire prevention and fire protection that time has crystallized into good practice." Acknowledgement is made to 124 technical experts in various engineering, insurance underwriting, and similar fields, for their assistance in compiling the new volume.

The work consists of 73 chapters, covering the subject of fire protection from virtually every conceivable approach, both from the standpoint of the hazards presented by the more obvious causes of fire, such as from various types of heating apparatus, faulty electric wiring, lightning, and flammable liquids and gases, as well as from less considered causes, such as from dangerous chemicals, metals, dust, and spontaneous ignition.

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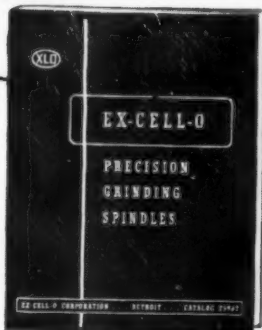
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185

ler systems, as well as to recent developments in foam, carbon dioxide, and inert gas methods of fire extinguishing. This useful book is a must for any industrial plant wherein the dangerous expense of fire is never absent.

WARREN'S BOOK ON AUTOMATIC SCREW MACHINE OPERATIONS

By Ralph A. Warren, Consulting Engineer, 9 So. Kedzie Ave., Chicago 12, Ill. 1945. First Edition. 300 pages, 8" x 11". Imitation leather cover. 14-ring Cercla Binding. \$10.00.

This is an extremely useful book which could be profitably read by a beginner, the practical screw machine operator, or by the screw machine engineer, either in actual study of the cases presented, or by using the volume as a reference work.

It presents a collection of thirty tested screw machine jobs, with various methods of approach which might be applied to each. The entire group covers applications which would refer to practically any screw machine problem

which might arise. The book begins with simple form and cut-off jobs, and progresses through difficult and involved operations; each step is shown complete in all its operations by means of a Lay-Out Sheet, Superimposed Cam Drawing, Instruction Sheet, and a Breakdown Drawing, showing the cam action opposite each individual operation.

The work is divided into eleven chapters, which cover virtually all possible approaches in screw machine methods regarding speeds, feeds, cam layouts, tooling, and estimating. The book is written in simple phraseology, making it easy to understand, since a minimum of non-technical language has been utilized.

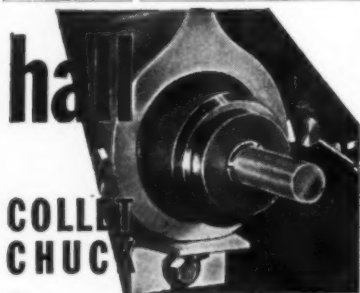
DESIGN OF METAL CUTTING TOOLS

By Frederick L. Woodcock, Chief Tool Engineer, Hamilton Standard Propellers Division, United Aircraft Corp. Published by McGraw-Hill Book Co., New York. 1948. First Edition. 406 pages. \$5.00.

This useful book contains a mine of information—rules, formulae, tables—to assist tool designers, draftsmen, shop foremen, superintendents, etc., in the most profitable and efficient design of all metal-cutting tools. The work has been based upon actual shop practice; it indicates the practical application of designing the particular tool for the job. It contains information on how to salvage worn-out tools and adapt them to new uses. It tells how tools are made to function accurately and economically.

The book discusses the fundamentals of design, including the elements of cutting, data on materials, heat treatment, oils, coolants, etc. It describes practical procedures and simplified instructions on the design of broaches, cutters, drills, hobs, punches and dies, reamers, etc. The volume contains many illustrations and line drawings to aid further in the clarification of the text.

The work is divided into two sections; the first, consisting of six chapters, takes up the fundamentals of design; the second and major portion of the book discusses at length the de-



SPEED UP production in multiple operations with push-out type Hall Collet Chuck. Full spindle capacity or over. Tremendous grip over or under stock size to .007—without adjustments...no bearings, friction, heat or loss of power. Instant release without stopping lathe.

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tails of design. A chapter is devoted to each major classification in the varied category of modern metal-cutting tool units.



GRINDING AND USE OF BASIC LATHE TOOL CUTTER BITS

South Bend Lathe Works
384 E. Madison St.
South Bend 22, Ind.
20 minutes. Sound. 16 mm. Full color.
Obtainable from South Bend Lathe Works on a free loan basis.

This new film is No. III in a series based on the book "How to Run a Lathe." It depicts the various steps necessary for the proper grinding and use of cutter bits for lathe operations such as threading, facing, boring, turning, etc.



The film has been produced under the direction of expert machinists and experienced educators to provide an effective and accurate instructional medium. Each step in grinding various types of cutting tools is shown in detail and the reasons given. Each type of cutting tool is shown in use and proper alignment with the work em-

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Remove
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Easily.

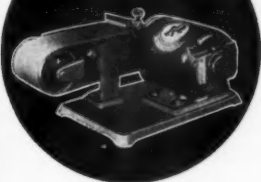
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An ideal bench surfer for small work in the toolroom. Quickly deburrs, chamfers, surfaces, rounds. The No. 601 can be used for flat surfacing jobs where accuracy is not an issue. A handy time saver around the plant. Furnished with motor and cord.

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phasized. Thread cutting is shown step-by-step from the thread tool grinding, through setting up the lathe, and starting and finishing the thread.

Industrial training can be greatly aided through the use of this film. Manufacturers, tool and die shops, and engineering firms will find it of assistance in showing their foremen and supervisors a proven procedure for the instruction of apprentice machinists and lathe operators. For the instruction of apprentice and operator groups, the film provides an effective medium for visualizing the correct procedure to be followed, greatly aiding their individual progress.

LEGEND OF USEPPA

Allegheny Ludlum Steel Corp.
2020 Oliver Bldg.,
Pittsburgh 22, Pa.

29 minutes. 16 mm. In full color with sound commentary. Obtainable from Allegheny Ludlum's Executive Office.

Allegheny Ludlum announces the re-

lease of its first non-technical motion picture. It tells the legend of a group of former pirate islands off the West Florida Coast and depicts a day of pleasure fishing for the Silver King tarpon. The picture is designed to provide a period of entertainment in programs of technical films and lectures.

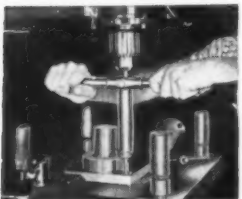
Made recently at the height of the tarpon season, the picture opens with the legend of how the buccaneer, Gasparilla, made the island group off the Florida Coast his headquarters, using centrally located Useppa not only for his favorite wife, but as the burying place for his stolen gold. The camera contrasts the vividly-colored flowers with the white sand of the beaches and the blue of the water. After creating that atmosphere, the camera follows a fishing party on a one-day expedition, watches as hooked tarpons leap from the water and fight to escape and then focuses on them being hauled in.

The film is lent free to users of Allegheny Ludlum's wide selection of technical pictures on metallurgy and allied subjects.

LASSY UNIVERSAL TAP & DIE GUIDE FIXTURE



Guide, removed from fixture, in use threading

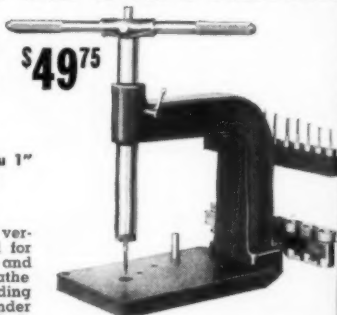


Guide, removed from fixture, in use tapping

Complete as shown with 12 adapters, No. 5 thru $\frac{5}{8}$ " (taps not furnished)

Capacity No. 5 thru 1"
Pipe taps to $\frac{3}{8}$ "
Dies to $1\frac{1}{2}$ " O.D.

This new, handy versatile tool is ideal for all hand tapping and threading. On the lathe tapping and threading can be done under power. Large work is tapped right on the drill press without juggling it around. Attaches to wall or bench. $12\frac{3}{4}$ " x $6\frac{1}{2}$ " x 17"; wt. 32 lbs.



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Complete line of Bench and Floor Tapping Machines.

Subject: SWISS PATTERN FILES



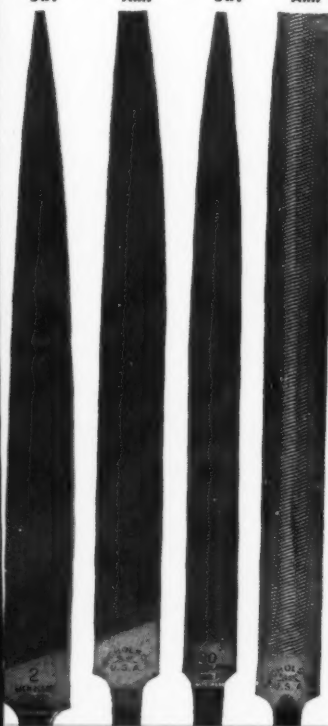
Typical comparisons of Swiss
and American Pattern files—
Knife and Half Round shapes

Sw.

Am.

Sw.

Am.



"PRECISION
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PRECISION WORK"
is a rule that pays off in
better results. Save this
(one of a series) for tech-
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Prepared by Nicholson File Co.

Difference between Swiss Pattern and American Pattern Files. . . . Nicholson X.F. Swiss Pattern Files differ in a number of respects from American Pattern files. First made for jewelers, watchmakers and fine tool-makers, today they are used wherever superfine precision filing is required.

Important differences are: (a) Swiss Pattern files are made to more exacting measurements. (b) Their points are smaller and the tapered shapes have a longer taper. (c) They come in *seven* degrees of coarseness, against the three usually supplied in American Pattern.

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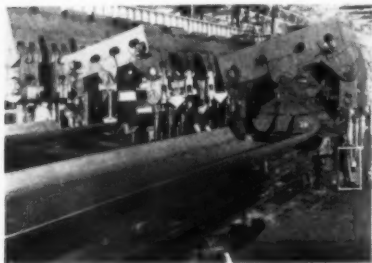
NICHOLSON FILES FOR EVERY PURPOSE

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WELDED LINE PIPE — MADE THE SMITHWAY

A. O. Smith Corp.
Milwaukee 1, Wis.
15 minutes, 16 mm. sound film. Obtainable through L. E. Snelyd, Sales Prom. Supervisor, A. O. Smith Corp., Milwaukee 1, Wis.



This film shows the undramatized but unique processes of manufacture of welded pipe. It is of general interest because of the immense size of the ma-

terials handled as well as the large automatic equipment which handles them. The film depicts the manufacture of Smithway Line Pipe, as it is made from rolled steel plates (skelp). The various steps are shown in sequence, from unloading the flat stock, pickling in an acid bath to remove rust and scale, inspection, the forming of the flat skelp into tube by powerful hydraulic presses (see illustration), flash welding, flash-trimming, and expanding the ends of the finished pipe to its required circumference. Final inspection, handling and shipping is also shown, as well as field welding of the pipe for recent war emergency pipe lines.

NMTBA SALES COURSE

Don't overlook the lectures of the Sales Refresher Course, sponsored under the auspices of the N.M.T.B.A., which begin in this issue of the **MACHINE AND TOOL BLUE BOOK**. This is "must" reading for metalworking executives.

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The Sturdy Square Holed Sleeve will save you many hours and many dollars in the making of boring bars, tool holders and other tools requiring square holes.

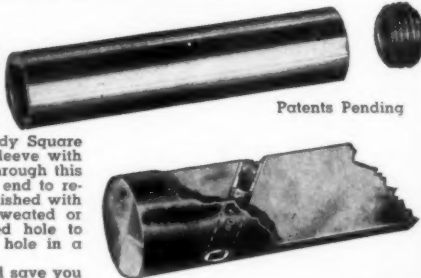
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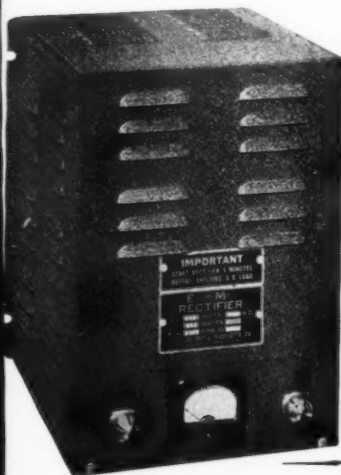
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2235 North Knox Ave., Chicago 39, Illinois



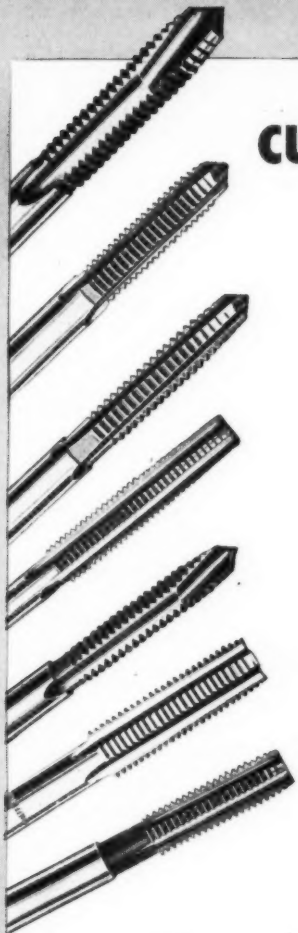
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LIKE
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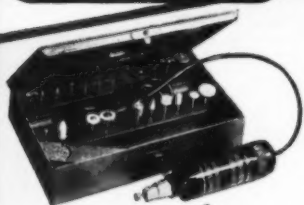


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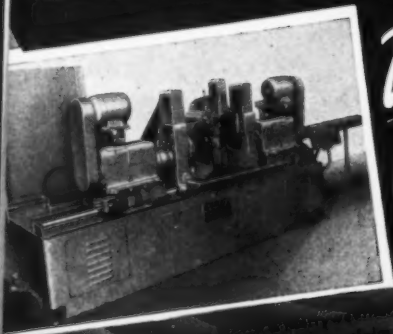
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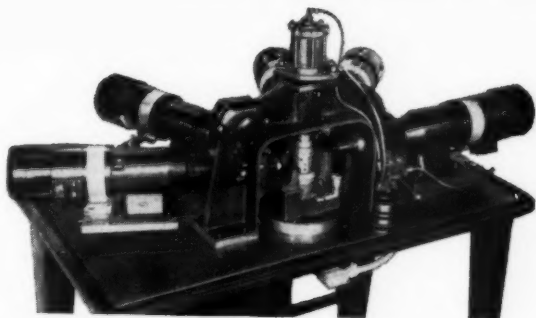


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SHELDON MACHINE CO. Inc.

Manufacturers of Sheldon Precision Lathes • Milling Machines • Shapers
4242 N. KNOX AVENUE • CHICAGO 41, ILLINOIS. U. S. A.

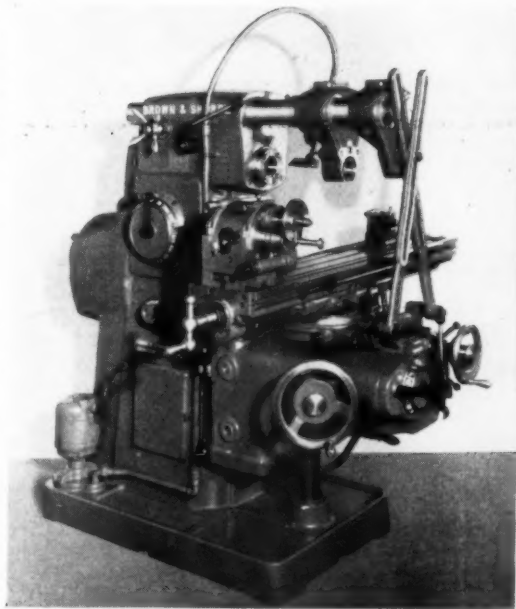
What's New in **METALWORKING**

B & S 5 H.P. UNIVERSAL MILLING MACHINE

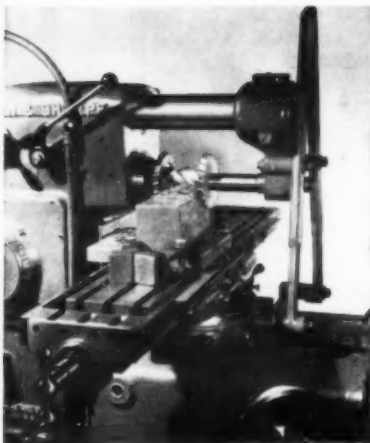
Designed to take heavier cuts than the well-known Brown & Sharpe Light Types, these new milling machines have an increased vertical capacity, a No. 50 Milling Machine Standard taper hole in spindle, suitable spindle speeds for larger cutters and ample rigidity for using the greater power.

Full 5 horsepower, all-gear drive is provided to cutters. Cutting feed and fast travel are independently all-gear driven by a $\frac{3}{4}$ h.p. motor synchronized with the spindle motor. Fast travel of 75" per minute in all directions, is available either with spindle rotating or stopped. A single lever selects any of the 18 spindle speeds from 30 to 1200 r.p.m. Power is imparted to the spindle at all speeds directly back of the front bearing mounting. A single lever also selects any of the 18 cutting

20 $\frac{1}{4}$ " per minute, uniform in all directions.



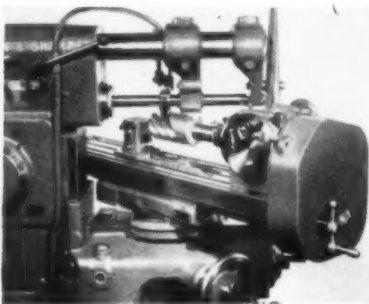
Standard front view of No. 2 Universal Milling Machine, 5 H. P.



This combined top and straddle milling operation shows how extended spindle face permits shorter overarm and arbor lengths, assuring great rigidity of cutter supports.

• • •

This milling operation shows how an extended spindle face permits cutting closer to spindle nose with considerable swing of table. Also shows universal spiral index centers with heavy trunnion-type headstock for rigidly supporting work on heavy cuts.



The coolant system is operated by a $\frac{1}{4}$ h.p. motor-driven centrifugal pump which automatically stops when the spindle stops and may be disconnected by a switch when not required. Full automatic lubrication is provided for column, knee, table, saddle and slides.

The new 5 h.p. machines incorporate the extended spindle face design, with the spindle nose extending forward more than 3" from conventional position. This brings the front spindle bearing nearer the center of the table, reducing overarm and arbor lengths, and gives greater rigidity of cutter support. The ability to mount cutters closer to the spindle nose reduces cutter and arbor vibration and cutter wear.

The extra-sturdy arbor support often permits the use of smaller arbors, using smaller diameter cutters, which give greater production, for they feed faster at the same surface finish and require shorter run-in.

When attachments are used on the extended spindle face of the machines, greater rigidity is secured with no loss of throat distance.

The Universal and Plain machines have a longitudinal feed of 28", transverse feed of 10", and vertical feed of $16\frac{1}{2}$ ". The Universal weighs approximately 4700 lbs. and the Plain, 4400 lbs. For complete information, write for 20-page illustrated Bulletin.

Brown & Sharpe Mfg. Co.

Dept. BB

Providence 1, R. I.

SMALL PLIER SET

A useful small plier set, No. 14, announced by the Bonney Forge and Tool Works, is designed to give the mechanic all pliers needed for ignition, starter, generator, carburetor, general light wiring and instrument work. Packed in a leatherette case, the set consists of a flat nose plier, a short chain nose plier and a diagonal cutting plier, all 4" in length. For details, write:

Bonney Forge & Tool Works

Dept. BB

Allentown, Pa.

PROSSER CARBIDE GRINDERS

... Pay for themselves—fast ...

in **TOOLS
SAVED!**

Shop experience proves it: Prosser Grinders reduce waste and breakage of costly cemented carbide tools — and help them deliver more cuts between grinds. Also equally effective for stellite and high speed steel.

QUICK SETTING. The famous Prosser index device speeds setting of table to desired angle. Table need never be raised or lowered — and once set, it stays put.

MORE WORK PER WHEEL. Easy compensation for wheel wear. Wheel face can be kept close to edge of table . . . wheels can be used up practically 100%. Fewer wheel changes, more time and money saved. Prosser Carbide Grinders are made in bench and floor models, for rough grinding and fine finishing, wet or dry. Chip-breaker and drill-grinding attachments.

Write for literature on money-saving Prosser Grinders — designed by the same Prosser engineers who introduced cemented carbide to American industry.



Model AA
for dry
grinding

Model EE
for grinding
dry or wet

Dealerships available

Established
THOMAS PROSSER & SON 1845 120 Wall Street, New York 5, N. Y.

NEW CINCINNATI DIAL TYPE MILLING MACHINES



Plain High Speed Dial Type Milling Machine

required while the part remains in the fixture or on the table.

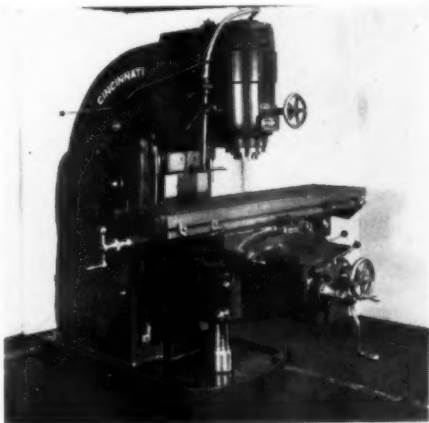
High speed machines have 21 spindle speeds 20 to 1500 r.p.m. for the No. 2 size and 18 to 1300 r.p.m. for the Nos. 3 and 4 sizes, in approximate geometrical progression. Twenty-four feeds, also in geometrical progression, cover a range of $5/16$ " to 60" per minute. Medium speed machines have a slightly smaller selection of speeds and feeds, and the upper limits are $1/3$ those for high speed machines.

Feed and rapid traverse control levers are independent and directional, and fitted with plastic knobs for convenience of the operator. Rapid traverse to the table, cross and vertical slides (100", 100", and 80" per minute, respectively) is engaged in conjunction with the rapid traverse lever and the feed engaging levers.

Vertical Dial Types (see illustration) have hydraulic counter balance for the vertical head. All Dial Types are

A new Dial Type Milling Machine announced by The Cincinnati Milling Machine Co., is built in medium and high speed ranges, in plain, universal, and vertical styles, Nos. 2, 3 and 4 sizes for each (eighteen different units).

The new machines have power speed and feed change, operable with a single two position lever at the front control position or a similar lever at the left-hand side of the column. The machine performs the actual work of shifting gears. While the operator holds the lever in the speed or feed change position, the speed or feed dial, as the case may be, clicks around, and upon release of the lever, the proper gears are in mesh for the speed and feed indicated. This unique feature is desirable where rough and finish cuts, or a variety of cutters, are



Vertical High Speed Dial Type Milling Machine

equipped with built-in vibration damping units located in the overarm of horizontal machines, and in the vertical head of the vertical machines.

Lubrication is mainly automatic. All

parts within the column are lubricated by a pump and splash system; parts within the knee are lubricated by a similar system; saddle, housing, and table parts are lubricated from a built-in manually operated plunger pump. The vertical feed screw operates in oil supplied from an individual reservoir which is built into the column at a level equal to the highest travel of the screw, thus assuring an adequate supply as the knee travels up and down.

In addition to an electrical disconnect switch, safety features include a contact button for the hinged motor compartment cover. Opening this cover for V-belt or motor inspection automatically breaks the circuit and stops the motor. All rotating shafts are enclosed. High voltages are reduced to 110 at the push button station. Upon engaging the power cross and vertical feeds or rapid traverse, the manual cranks are automatically disengaged to prevent their spinning.

Standard equipment includes motors and controls with all styles. In addition, vertical types are equipped with power feed and rapid traverse to the vertical head, and a four position, dial indicated turret stop. Complete specifications on all models may be obtained upon request to the manufacturer for publication No. M-1623.

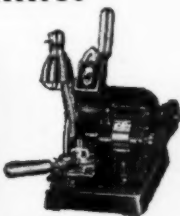
The Cincinnati Milling Machine Co.
Dept. BB
Cincinnati 9, Ohio

ALL-STEEL PIPE AND STRIP IRON TRUCK

A new all-steel unit, the Wheel-It, for wheeling any heavy, bulky material, such as building materials, wire, fencing, pipe, iron, etc. is being offered by Bassett Industries. Cumbersome materials may be loaded on this hand operated vehicle and wheeled around the yard or warehouse, saving time and labor.

The legs of the Wheel-It extend to give stability when needed. Caster wheel extension legs are also available at option. The unit is all welded, having no bolts, and is built like a bridge, with cross bracing for added strength. It has a tested capacity of 2000 lbs., yet can be readily wheeled when fully

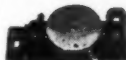
If it's a SMALL PART.. Mill it with a New Rouse Hand Miller



\$98 (Without Fixtures)
F.O.B. Chicago, Motor Extra

NEW
Rouse
**HAND
MILLER**

Rouse
**Fixture Set-Ups
that Speed Pro-
duction.**



No skill is required. Anyone can quickly learn to operate this unit with speed and accuracy. It's ideal for making light cuts in brass, aluminum, steel and other metals . . . also for rounding and burring cast iron and steel.

Many manufacturers use a Rouse Miller for second operations on plastics.

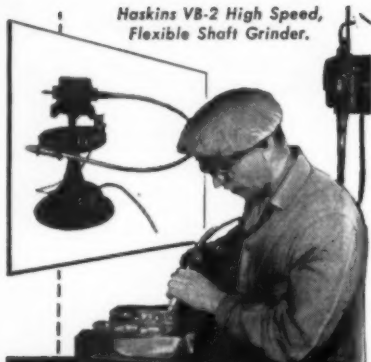
With Rouse Fixture Set-Ups, productive capacity is greatly increased for a large variety of parts for instruments, electrical work, aviation components, etc.

Available for immediate shipment.
Write for illustrated circular and full details.

**H. B. ROUSE
AND COMPANY**

2216 N. Wayne Ave. Chicago 14, Ill.

Haskins VB-2 High Speed,
Flexible Shaft Grinder.

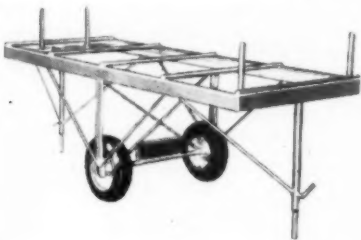


**Tools last longer
... cut smoother!
With NEW
HASKINS VB-2!**

Because this new Haskins flexible shaft, high-speed grinder develops up to 18,000 R.P.M. free speed, small carbide rotary cutters and grinding wheels cut faster... with less pressure... last longer! And they cut smoother, too! A tapered, cool running, ball-bearing, collet type spindle provides finger-tip control for the operator. Designed for both bench and suspended use, VB-2 is built throughout to stand up under continuous, high-speed operation. Find out today about this indispensable tool for general light production work. Write for details. R. G. Haskins, 2645 W. Harrison Street, Chicago 12, Illinois.



loaded, by one operator. Sixteen-inch arms at the top of the unit adjust sideways for a load, or fold down for flat material. The overall size is 3' wide, 8' long, and 34" high. The 24" steel pipe legs have 16" extension legs. Equipped



with 4:00 x 8 industrial type tires and tubes with 60-pound pressure; wheels have roller bearings. For additional information, write:

**Bassett Industries, Dept. BB
Vinton, Iowa**

TOOL HOLDER SERVES AS MULTIPLE SCREW DRIVER

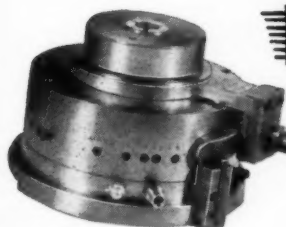
An ingenious new tool holder equipped with a hollow handle with a screw cap has recently been developed by Stanley Tools. All that is necessary to put this accessory into use is to select the proper bit from the handle compartment and insert it. Since the holder in the handle will contain several bits, this driver is the answer to the increasing use of Phillips head screws for assembling industrial and automotive units, while still maintaining its usefulness in driving slotted head screws.



The No. 88 Holder, illustrated, is supplied with three bits, one for slotted head screws Nos. 7, 8, and 9; the other two are for Phillips screws Nos. 5 through 9 and Nos. 10, 11, 12, 14, and 16. For complete details on this tool, write:

**Stanley Tools, Dept. BB
New Britain, Conn.**

"Air Devices by Redmer"



RC-5



Index Chuck

with Air Operated Collet

Eliminates removing chuck from base of machine for changing index position. Index screw posts located on OUTSIDE of chuck. Provides positive alignment and depth control by using stationary type collets. Capacity 1/16" to 2".



Air Foot Control and Valve

Designed to make its operation as tireless as possible. Opening and closing of plunger of valve on foot pedal is operated by a roller on pedal casting which relieves wear on plunger and facilitates operation. Valve is a brass casting which will take plenty of abuse and can be removed from the foot control and used as a separate unit in connection with cam operations.



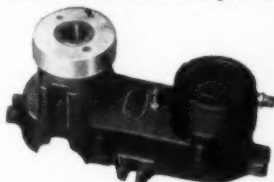
No. FC-28

V-29



Collet Air Chuck

An air operated collet holding fixture using same type collets as Brown & Sharpe automatic screw machines. For drilling, milling, threading, etc., also for assembly work. Six models, No. 00, No. 10, No. 0, No. 2, No. 2 Special, No. 4, Collet Capacity 1/16" to 3 1/2".



Write for literature and prices

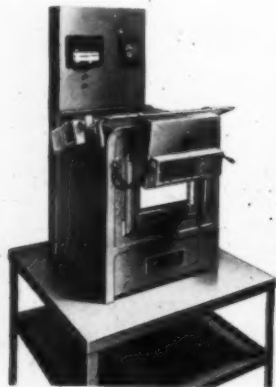
REDMER AIR DEVICE CORP.

9136 West Belmont Avenue

Franklin Park, Illinois

WIDE TEMPERATURE RANGE IN NEW ELECTRIC BOX FURNACE

Accurately controlled temperatures in the range from 2000° F. to as low as 300° F. are available in the new, Model VK-6 Cooley Electric Box Furnace. This range permits not only hardening and other high temperature work, but also low temperature applications such as tempering or drawing of steels, non-ferrous heat treating, etc. Having an



8" x 6" x 14" chamber, the Model VK-6 is useful for tool and die work, production heat treating of small parts, running pilot lots, emergency repairs, industrial and laboratory testing, and other work within its range where controlled heating is essential.

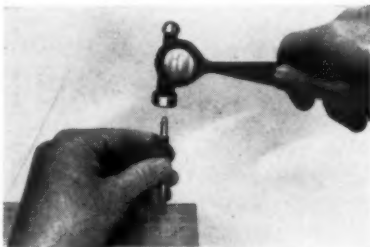
The Model VK-6 is made with a simplified vertical lift door having exterior mechanism and counterweights. The vertical sliding door conserves heat when charging small parts since only a limited portion of the chamber need be exposed. Power capacity of the furnace is 4650 watts. Since only 2½ kw. are required to maintain 2000° F., ample capacity is available for heating whatever work is charged. Rapid and uniform heating is assured by six embedded-type heating elements. The furnace heats from cold to 2000° F. in 1½ hours, or in only half this time after overnight shut-down.

Highly accurate temperature control down to as low as 300° F. is available, since the new Model VK-6 furnace is equipped with the Cooley Selective Power Modifier. Used in combination with an indicating-controlling pyrometer, this unit permits meeting very critical temperature requirements. Power input may be adjusted to balance furnace heat losses, and low temperature overshooting of the pyrometer is eliminated. For detailed specifications, write for Bulletin 73-A on Model VK-6 furnace, and catalog on complete Cooley line to:

Cooley Electric Manufacturing Co.
36 S. Shelby St., Dept. BB
Indianapolis 7, Ind.

DIE MAKER'S HAMMER WITH BUILT-IN MAGNIFIER

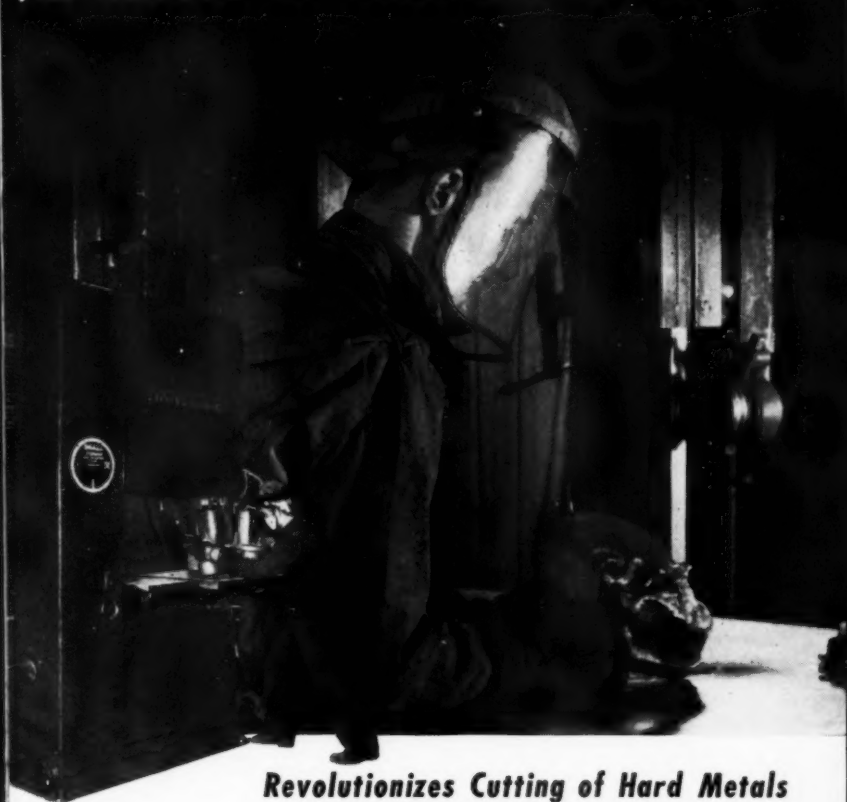
Accurate spotting and punching of center lines and intersections is simplified by a Tool and Die Makers' Hammer introduced by The L. S. Starrett Co. A 7-power lens built into the head of the hammer eliminates the usual fumbling or looking away involved when separate glass and hammer are used. A punch can be precisely spotted and accurately struck without removing the eyes from the work.



The hammer is made from a steel forging with flat and ball peen heads and weighs only 4 ozs. The heads are offset to permit use in corners or close to obstructions. For complete information, write:

The L. S. Starrett Co., Dept. BB
Athol, Mass.

The MAGIC OF FRICTION SAWING



Revolutionizes Cutting of Hard Metals

Friction sawing pays big dividends wherever cutting and trimming of metal are large-scale operations. Foundries use it to trim castings in a fraction of the time previously required. Fabricating plants use it to cut stainless steels, alloys, armor and boiler plate, steel tubing and pipe. Even hardened cutting tools themselves like files and milling cutters yield to friction sawing—are sliced in just a few seconds.

In this economical cutting process, the special DoALL Friction Saw Blade quickly builds up the frictional heat between the material and the saw blade traveling at speeds up to three miles per minute. This heat causes material plasticity at a point directly in front of the saw which momentarily softens the metal so that the teeth can strip it away easily.

Investigate how friction sawing can pay you dividends.

1001
DIVERSIFIED
APPLICATIONS
of
DoALL
CONTOUR
MACHINES



OTHER PRODUCTS

- Saw Bands
- Bandfiling Machines
- Jigfiling Machines
- Surface Grinders
- Inspection Equipment
- Punch Presses
- Lathes, Profilers
- Heat-Treating Units
- Tool & Die Steel

PRECISION TABLE FOR BELT GRINDER

An improved automatic feed table, the Model FT-9, is now available for the Porter-Cable Model BG-8 Wet Abrasive Belt Grinder. The redesigned

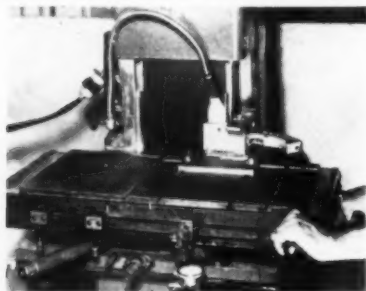


table provides greater precision and a smoother approach for feeding work into the grit belt.

Any material may be ground and polished to a close tolerance — plastics, glass, ceramics, wood, etc. Simple

inexpensive fixtures reduce cost and save loading time. The machine chamfers, rounds, squares, forms radii, grinds flat and parallel surfaces.

Earlier models of the FT-9 Table used the same oil-coolant in the recirculating system as a hydraulic liquid for the feed table. Two separate systems have now been installed. Special coolants may be used for various materials, while the table is independently operated by a standard hydraulic oil.

In addition, a rod has been added to the former free piston, with a gland at the end of the cylinder oil shield, to assure smooth positive action at all times.

The FT-9 Table automatically controls the pressure and rate of feed while a dial indicator shows rate of machining. A micrometer stop halts the operation, and can be reset instantly.

For further information, write:

Porter-Cable Machine Co.
Syracuse 8, N. Y.



Model 1400-E Pivot Mount

These air cylinders are made to your order with any length stroke you request in any of these bore sizes:

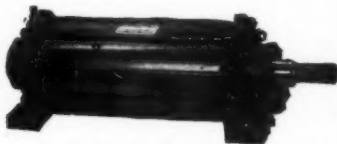
1½, 2, 2½, 3, 4, 5, 6, 8, 10

In ordering please write mounting, bore, stroke and piston rod thread you want.



Series "E"
Model 1300
Rear Flange
Mount

1 WEEK DELIVERY ON THESE STANDARD CYLINDERS



Series "E" Model 1500
Foot Mount



Series "E" Model 1200 Front
Flange Mount

PNEUMATICS INCORPORATED
OF PLYMOUTH INDIANA

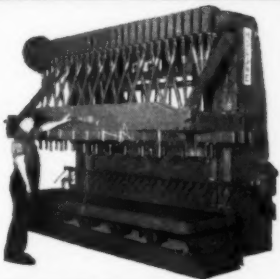


- ★ At greater Man-Hour **SAVINGS**
- ★ At higher rated **EFFICIENCY**
- ★ At finer, effortless **PRECISION**

A Moline Multiple Spindle Specially Designed Machine Tool can do your job better at less cost. Ruggedly built to fit your **INDIVIDUAL** requirements in such operations as Boring—Straight Line Drilling—Universal Adjustable Spindle Drilling—Honing—Tapping—Reaming—Counterboring—Special Milling—these machines are based on years of experience accumulated since 1901.

For your **SPECIAL** problem go "Hole-Hog" and write us for any information you may need.

No. HUGG DRILLER



MOLINE TOOL COMPANY
100 20th Street Moline, Illinois

TRAINING CONFERENCE ON INDUSTRIAL EXPERIMENTATION

A five-day training conference in Industrial Experimentation will be offered by the Engineering School of Columbia University, New York, September 14-18, 1948. The course is intended to provide both formal and practical insight into fundamentally effective techniques for persons with a background of experience and at least one course in statistics, quality control, or the equivalent.

The subject matter of each day will be treated as a unit, the morning periods given over to the presentation of formal principles and problems, while the afternoons will be conducted as clinic sessions, with specialists from industry as speakers. The topics to be considered include the nature of problem in industrial experimentation; the role of control charts, correlation, analysis of variance and their interrelation in the design of experiment; assumptions underlying analysis of variance,

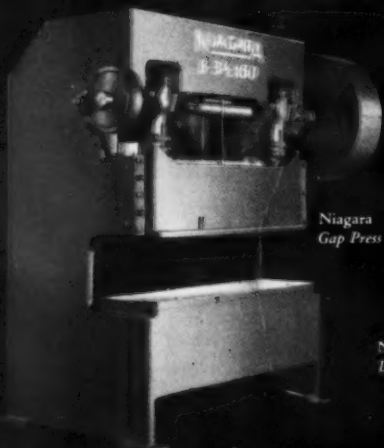
one-way and two-way classifications; Latin squares, fractional designs, sequential methods. There will also be a special session on computing machines at the Watson Scientific Computing Laboratories.

The full-time instructors will be Professors S. B. Littauer, Department of Industrial Engineering, J. Wolfowitz, Department of Mathematical Statistics, and Mr. R. E. Bechhofer, Department of Industrial Engineering, all of Columbia University. The industry specialists will be Dr. Beverly Clarke of Merck and Company, Dr. E. V. Lewis of the Carothers Research Laboratory, E. I. du Pont, Dr. Harry Romig of Bell Telephone Laboratories, Colonel Leslie E. Simon of Army Ordnance, Aberdeen Proving Ground, and Ralph E. Wareham of National Photocolor Corporation.

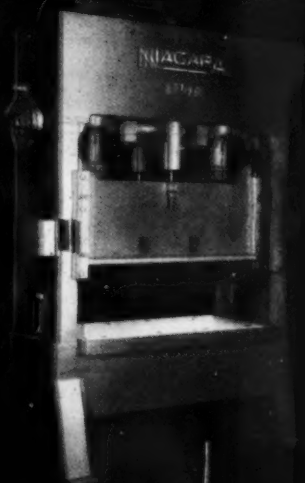
Write to: Professor S. B. Littauer, Department of Industrial Engineering, Columbia University, New York City 27.

NIAGARA

PRESSES, SHEARS
TINNERS TOOLS *for*



Niagara
Gap Press



Niagara
Double Crank Press



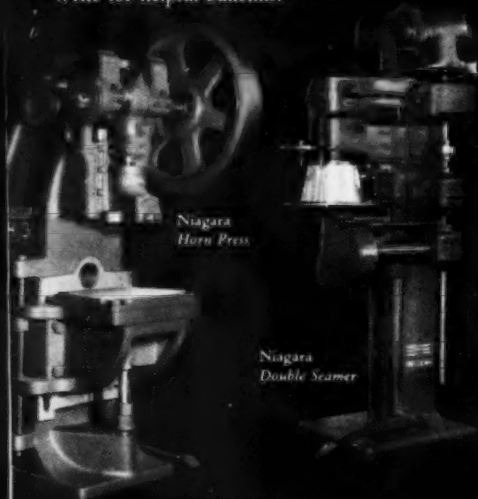
Niagara
Slip Roll Former

NIAGARA MACHINE AND TOOL WORKS, BUFFALO 11, N. Y.

RA

MACHINES and SHEET METAL

Operations including shearing, blanking, punching, forming, flanging, beading, corrugating, seaming and many others are being done quickly, economically and accurately on Niagara machines. Niagara machines and tinner's tools on these pages are just a few of the hundreds of types, sizes and capacities which make Niagara America's most complete line. Write for helpful bulletins.



Niagara
Horn Press

Niagara
Double Seamer

District Offices: Detroit, Cleveland, New York

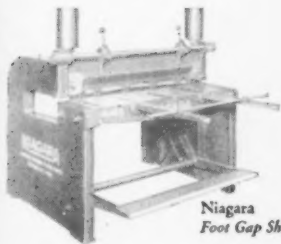


Niagara
Ring and
Circle Shear

Niagara
Rivet Set and Header



Niagara
Hollow Punch

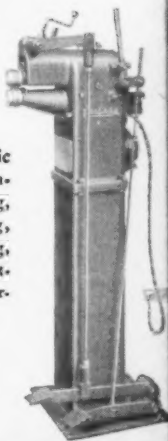


Niagara
Foot Gap Shear



Niagara
Snips

● Niagara Electric Combination Machine for burring, turning, wiring, beading, crimping, elbow edging, slitting and other operations.



NEW HEALD BORE-MATICS FOR LARGE WORK

The Heald Machine Co. announces a new series of Bore-Matics, the largest in the new Heald line. These massive units are designed for precision boring, facing, turning, chamfering, or grooving operations on large, heavy work such as tailstocks, cylinder blocks, etc. Heavy, cumbersome work of this kind can be handled with greater convenience, since the table is built low to the floor, permitting easy loading from conveyor or overhead crane.

These new models are all basically the same machine except for length. Models 521 and 522 (illustrated) are standard single and double end machines respectively; Model 524 is a single end type with a long base for extra capacity requirements.

All models incorporate the massive, one-piece base casting with widely spaced, scraped vee and flat ways extending nearly its entire length. Lubricated by a separate controlled pressure system, the ways are covered at all table positions, keeping out wear-inducing foreign matter.

Permanently lubricated boring heads require no attention, and run cool. From one to seven or more individual boring heads or a special multi-spindle head unit to suit the job can be installed on each bridge, providing a wide range of applications. Roughing and precision finishing can be performed at a single set-up, eliminating an extra operation on many jobs.

The low table, only 22" from the table top to floor, simplifies the loading problem for heavy, awkward work.

Uniform hydraulic feeds of from $\frac{1}{2}$ to 32 i.p.m. in the fast range (for "in" feed only), and from $\frac{1}{2}$ to 25 i.p.m. in



the slow range (for "in" or "out" feed, or both), remain constant, regardless of the oil temperature changes, maintaining definite production, finish, and accuracy.

A constant pressure dump valve automatically furnishes only the amount of oil required during each phase of the entire machine cycle, saving power cost, lessening generated heat, and improving work accuracy. Provision has been made on the main control panel for the installation of units for operation of hydraulic fixtures, cross slides, chucks, etc.

Sensitive brake adjustments permit instantaneous action at predetermined points in the cycle, cutting down boring time, and tool wear when facing. The brake is self-compensating for band wear.

The electrical system is designed to meet generally accepted codes, and to simplify electrical maintenance. Adequate provision has been made for the control of debris and coolant, with a tray table which confines chips and cutting fluid, keeping the floor clean and safe.

On the illustrated model 522, the

bridges are 47" wide, with 52", 62", or 72" between the bridges. The standard maximum table travel is 30"; special, 40". The table pad measures 28" x 40"; width of table is 36". For complete specifications on these new Bore-Matics, write:

The Heald Machine Co.
Dept. BB
Worcester 6, Mass.

MOTOR-MOUNTED COLLET CHUCK SERVES AS LATHE

A recent modification of the Goodwin collet chuck adapts it for use with any standard electric motor to perform as a simple and low cost "lathe" for secondary operations such as deburring, filing, and polishing. Conversion is accomplished by the addition of a shaft adapter and adjustable stop. A spring ejector can be provided to speed production work.

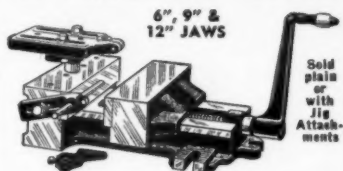
The chuck body is made in two parts to facilitate accurate mounting, and will run true on motor shaft without "wobble." Models can be furnished



with either straight or tapered holes, depending upon the motor shaft. Solid, sturdy construction and the elimination of unnecessary moving parts guarantee maximum service life.

The worker shown in accompanying illustration is inserting small bushings for deburring. Spring ejector insures

One VISE with OVER A THOUSAND USES!



GRAHAM MULTI-PURPOSE VISE

In 3 sizes up to 124 lbs. This vise is available with attachments including



Request
 Bulletin 41

stops, guides, V-jaws, shell jaws, bushings, etc. Enables you to do innumerable jobs that would normally require specially made jigs or fixtures. Ideal for accurate, repeat-operation positioning of thousands of different shapes.

"Adjust-angle" KNURL HOLDER

All standard
 patterns
 using only
 straight
 knurls



On work up to 2 1/2" dia., this Knurl Tool produces a variety of straight, spiral and diamond patterns, using only straight knurls. Shank made to fit your turret (or lathe tailstock). Equipped with passing-over-stock feature if desired. Graduated adjustment of knurl angle.

For prices and details request
 Bulletin 41

GRAHAM MFG. CO.

54 Bridge St. East Greenwich, R. I.

CUT TOOL and DIE MAKING COSTS 40% to 60%

...with these 2 MACHINES



The MILWAUKEE DIE FILER

Model FS with new All-Purpose, Deep-Throated Overarm performs all tool and die-making operations efficiently, at low cost.

Files, saws and lapping sticks chucked at upper end. Spring tension adjusted in overarm chuck. Chucking close-to-work assures rigidity of saws and files. Table tilts 15° in four ways. Lower chuck has ball-jointed jaw for true alignment of files with crooked shanks,

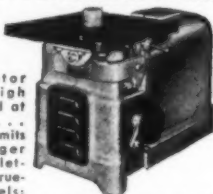
The MILWAUKEE PROFILE GRINDER

Built for Precision Grinding

Available in two models — STANDARD and HIGH SPEED . . . for mounted stone wheels and diamond or carbide wheels respectively. 1/2 H.P. Ball

Bearing Motor maintains high spindle speed at Full Capacity . . . no stalling. Permits use of larger wheels. Collet-Chuck assures true-running wheels;

permits fast, easy mounting or removal of wheels. Built-in Diamond Wheel Dresser always ready — no loose parts to assemble. Write for Bulletins and name of nearest dealer



RICE PUMP & MACHINE CO.

Division of Milwaukee Chaplet & Mfg. Co.

1027 S. 40TH STREET • MILWAUKEE 4, WIS.

MILWAUKEE

DIE FILERS • PROFILE GRINDERS

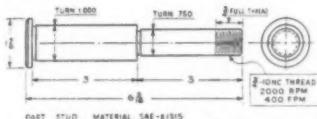
efficiency and maximum speed on this type of operation, and quick release feature, standard on Goodwin chucks, allows chucking of the workpiece without stopping motor.

Goodwin chucks are available in two sizes. The 1-inch capacity model fits motors having up to 1 1/2" shaft diameter. This chuck has outside diameter of 3 1/2", over-all length of 3 3/8", and a 2" overhang. The 2-inch capacity model has 5 1/2" diameter and 2 7/8" overhang, and will fit any shaft up to 3 3/8" diameter. For additional details, write:

The Goodwin Mfg. Co., Dept. BB
Cuyahoga Falls, Ohio

CARBIDE TIPPED DIE CHASERS


Now, for the first time, Jones & Lamson announces, carbide-tipped die chasers with ground thread forms are available for selected applications on turret lathes, automatics and threading machines.



For example, the turret lathe job, shown here, has a 3/4-10 NC thread which was cut with a tangent die head in 1/3 of a second at 2000 RPM (400 FPM). A high quality finish with a class III tolerance is obtained. Carbide chasers made it possible to machine this stud complete with the spindle turning at 2000 RPM for the entire sequence of cuts, thus eliminating the need for shifting to a low threading speed.



Besides increasing threading speeds, the lengthy tool life of these chasers furnishes amazing economy when they are suitably applied and correctly handled. They are outstandingly effective in steel and still more efficient



Characteristic of the design of all STURDIMATIC LIVE CENTERS is a low overhang and a slight cushioning action . . .

that compensates for expansion due to heat, shock and excessive thrust loads—reducing wear to a minimum. A properly engineered live center is one of the fundamentals of setting up a job and requires a specialist's experience . . . standard shanks with Morse taper carried in stock.

Send us your specifications and blueprints—We will see that your job is set up with the right LIVE CENTER.

STURDIMATIC
TOOL COMPANY
5210 THIRD AVE. DETROIT, MICH.

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215

CUT TOOL and DIE MAKING COSTS 40% to 60%

...with these 2 MACHINES



The MILWAUKEE DIE FILER

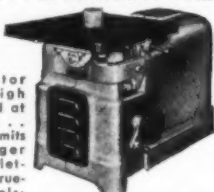
Model FS with new All-Purpose, Deep-Throated Overarm performs all tool and die-making operations efficiently, at low cost.

Files, saws and lap-ping sticks chucked at upper end. Spring tension adjusted in overarm chuck. Chucking close-to-work assures rigidity of saws and files. Table tilts 15° in four ways. Lower chuck has ball-jointed jaw for true alignment of files with crooked shanks.

The MILWAUKEE PROFILE GRINDER

Built for Precision Grinding

Available in two models — STANDARD and HIGH SPEED . . . for mounted stone wheels and diamond or carbide wheels respectively. 1/2 H.P. Ball Bearing Motor maintains high spindle speed at Full Capacity . . . no stalling. Permits use of larger wheels. Collet-Chuck assures true-running wheels; permits fast, easy mounting or removal of wheels. Built-in Diamond Wheel Dresser always ready — no loose parts to assemble. Write for Bulletins and name of nearest dealer



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DIE FILERS • PROFILE GRINDERS

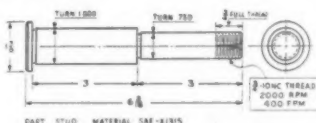
efficiency and maximum speed on this type of operation, and quick release feature, standard on Goodwin chucks, allows chucking of the workpiece without stopping motor.

Goodwin chucks are available in two sizes. The 1-inch capacity model fits motors having up to 1½" shaft diameter. This chuck has outside diameter of 3½", over-all length of 3¾", and a 2" overhang. The 2-inch capacity model has 5½" diameter and 2⅞" overhang, and will fit any shaft up to 3¾" diameter. For additional details, write:

The Goodwin Mfg. Co., Dept. BB
Cuyahoga Falls, Ohio

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that compensates for expansion due to heat, shock and excessive thrust loads—reducing wear to a minimum. A properly engineered live center is one of the fundamentals of setting up a job and requires a specialist's experience . . . standard shanks with Morse taper carried in stock.

Send us your specifications and blueprints—We will see that your job is set up with the right LIVE CENTER.

STURDIMATIC

TOOL COMPANY

5210 THIRD AVE. DETROIT, MICH.

in hard rubber, fibre and abrasive materials which have a rapid dulling action on ordinary chasers.

Carbide chasers are not to be considered a solution to every threading problem, for they can only be used successfully on machines with sufficient power, speed and rigidity to handle carbide tooling effectively. Because of these and other rigid requirements, selection of suitable jobs should be determined by submitting complete job specifications for engineering analysis. For additional information, call or write:

Jones & Lamson Machine Co.
Dept. 710
Springfield, Vt.

ROTARY MAGNETS HAVE WIDE INDUSTRIAL APPLICATION

New loading and releasing principles feature a line of non-electric Multilift Rotary Magnets now in production. The design provides increased carrying capacity plus efficient releasing in retrieving parts from tanks, separating

ferrous from non-ferrous materials, picking up steel from floors, cleaning tramp iron from conveyors and many other purposes.

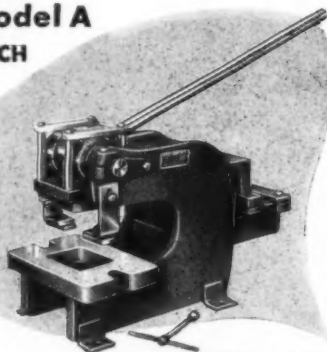
The units retain their strength without charging, requiring no wires or electricity. The Alnico permanent magnets are sealed in a metal tube mounted rigidly between Neoprene wheels in the carrying frame. A handle is attached to the frame and the unit is rolled; the tube revolves with the wheels and the entire magnetic surface becomes loaded, thus providing capacity greater than when only the underside of magnet can be loaded. The unit's capacity depends on size, weight and iron content of load components.

Unloading is accomplished by pushing the Neoprene wiper ring to a non-magnetic area at one end, where the load drops off. Catching hold of the sides of metal tanks is prevented by the wheels; and parts jump up 1 or 2 inches to the tube.

Multifinish Mfg. Co., Dept. 562
2114 Monroe Ave.
Detroit 7, Mich.

Leslie Model A

HAND PUNCH PRESS



PRICE
\$120.00

**Eliminate Die Changes...
On Short Runs**

Dealer Inquiries Invited

LESLIE WELDING CO., 2941 Carroll Ave., Chicago 12, Ill.

Large Punch Plate and Bed—6" throat—15 Ton Capacity—accuracy of leader pin die set—all found in the new LESLIE Model A Hand Punch Press. Why change dies when this compact, easy operating press can take care of your short runs?

Write for complete information
Diagram below illustrates versatility of the LESLIE press—each blanking done with one stroke.



NEW BUCKEYE

**STREAM
POWER**

vertical grinders and sanders



**GREATER PRODUCTION
AT LOWER COST**

SPEEDS: 3000 to 6000 RPM

WEIGHT: 10 lbs.

CAPACITIES: 6" cupwheel, 7 or 9" sanding pads.

• Speed production—cut costs with Stream-Power Vertical Air Grinders and Sanders. They're completely streamlined, twice as powerful! Newly designed Buckeye Stream-Power air tools also include Horizontal Grinders, Wrenches, Shears, Nibblers, Drills and Screwdrivers. You get 26 new construction, performance and maintenance features.

65 to 70% more power—weight reduced 22 to 29%—they're 9 to 12% smaller.



You really should have complete information on the new Stream - Power line. Drop me a note and I'll send it to you immediately.

Betty Buckeye

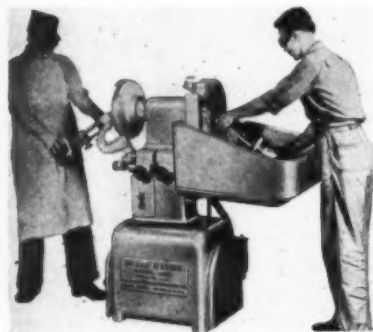
BUCKEYE *Air and Electric*

PORTABLE POWER TOOLS

BUCKEYE TOOLS CORPORATION, DAYTON 1, OHIO

GRAND RAPIDS DRILL GRINDER

A complete line of new Twist Drill Grinding Machines in sizes suitable for sharpening drills from No. 52 to 4"



has been announced by the Galmeyer and Livingston Co. The new CWA Double Holder Machine (see illustration)

is designed to sharpen standard 2, 3, and 4 flute drills of either straight shank or taper shank type at the standard 59° angle. This machine has capacity for sharpening twist drills from No. 52 to 2½". The small drills are ground dry on one side of the machine, the large drills wet on the opposite side. The double holder construction provides maximum convenience in the handling of small drills, with the necessary capacity for the large ones.

The grinder is built around a heavy, rugged, one-piece column designed to provide maximum rigidity to the entire machine. It is equipped with an accurately machined spindle, running in double row precision ball bearings, which are capable of resisting heavy combined radial and thrust loads. The bearings are greased-packed with built-in shields for retention of lubrication and exclusion of grit and dirt and thus require no further lubrication.

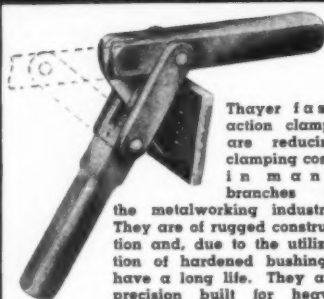
The drill holder proper is designed to take 2, 3, and 4 flute drills of either straight shank or taper shank type, and the only adjustment necessary when changing from the sharpening of a small 2-flute drill to the grinding of a 3-flute drill of a large diameter is to slide the tailstock so that it compensates for the difference in length.

The drill holders are equipped with a rectangular lip rest which supports the lip of the drill. This lip rest is reversible from side to side, or from top to bottom, should it become worn in one position after sharpening hundreds of drills of one size.

The diamond truing device for dressing the face of the grinding wheel enables automatically maintained relationship between the holder and the face of the grinding wheel. It is not necessary to swing the holder out of position when dressing the wheel. As the diamond is fed into the wheel for dressing, the holder is automatically moved in to compensate for such amount as may be removed from the face of the grinding wheel by the diamond dresser.

The Style CWA Machine is equipped with 12" diameter grinding wheels and with 1½ h.p. ball bearing motor for

REDUCE CLAMPING COSTS WITH THAYER CLAMPS



Thayer fast-action clamps are reducing clamping costs in many branches of

the metalworking industry. They are of rugged construction and, due to the utilization of hardened bushings, have a long life. They are precision built for heavy duty work.

Full size template sheets sent on request.

Write for Full Information.

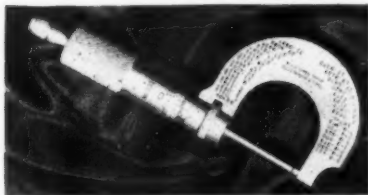
C. E. THAYER MACHINE & MFG. CO.
307 Bird Avenue Jackson, Michigan

spindle drive. With the vee-belt drive it is possible to operate just the right spindle speed regardless of current cycle of machine operation. Grand Rapids Drill Grinders are described in bulletin GL 2-48, available upon request to:

Gallmeyer & Livingston Co., Dept. BB
405 Straight Ave., S. W.
Grand Rapids 4, Mich.

STARRETT "SATIN CHROME FINISH" MICROMETERS

The L. S. Starrett Co. announces that Starrett micrometers, including Friction Thimble and Black Frame Micrometers, will now be furnished with "Satin Chrome" finish, which is produced by a special process which results in a glare-free non-reflecting surface against which markings and graduations stand out sharply under any illumination. The glaring halations and dark shadows which make bright finished micrometers hard to read are eliminated. The new finish is also more resistant to stains and corrosion.



Other refinements which are now standard features of Starrett micrometers include: "Hi-Micro" (mirror-like) finish on faces of anvils and spindles to insure more accurate measurement; micrometer screw hardened, stabilized and with threads ground from the solid; new quick-reading figures with every graduation on the thimble numbered for positive identification; decimal equivalents of 8ths, 16ths, 32nds, and 64ths conveniently marked on the frame; simple adjustment for wear. For information write:

The L. S. Starrett Co., Dept. BB
Athol, Mass.



MODEL
VH-2

**FLEXIBLE
ABRASIVE BELT
GRINDER**

*"The All Purpose
Machine"*



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- PLATEN
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**FLOOR OR
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1614 Douglas Ave. • Kalamazoo 54, Mich.

OPTICS FOR GRINDING

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**YOUR CARBIDE
TOOL ANGLES**

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OPTI-CHECK

- Magnifies Tool
- Magnifies Reading
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- Makes Duplication of Sharpening Angles Easy.
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STERLING MFG. CO.

Successors to The Benton Company
COVINA, CALIFORNIA

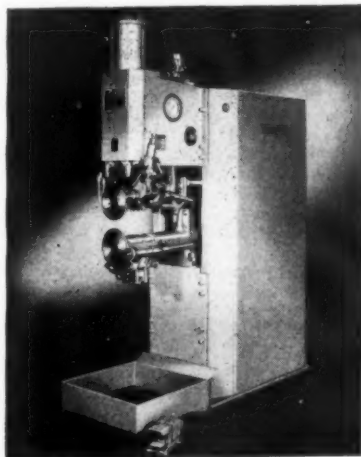
ROLLER HEAD SEAM WELDER

A complete new line of roller-head seam welders has been announced by Progressive Welder Co., Detroit 12. The line comprises three basic sizes — light, medium and heavy duty. Each size is available in three types — for circular welding, for longitudinal welding, or for both circular and longitudinal welding ("Universal" models).

Among the outstanding features of the new line is the use of a head completely guided and aligned by four sets of anti-friction rollers, insuring that the welding wheels will follow up and down even extremely small deviations in material thickness and contour. As a result it is possible to maintain constant weld-pressures even where stock thickness varies along the seam—assuring consistent even weld characteristics.

The rollers are matched in pairs, adjustable pre-loaded, and guide the head the full length of its vertical travel, riding on positive alignment V-guides on hardened and precision ground ways.

This construction has been made successful by the frame design of the new machines. Instead of having a fairly uniform cross-section, the front of the machine column is extremely rigid and well braced, while the rear of the column — where there are negligible stresses — is of fairly light construction designed to provide maximum accessibility to all components inside of the machine.



M·B *Model S-VT*
18,000 RPM



"SPEE-DEE" *Pneumatic*
POLISHER

A new development filling a distinct need. Produces remarkable results on real production work when abrasive rolls and pencils, also bands, etc., are used. Flexible air-control lever for starting and stopping. Husky, light weight, 14 oz. Power to spare. Special grease-sealed bearings. Will handle many applications, also with "High-Speed" Rotary Files. Representatives in Principal Cities.

M·B PRODUCTS
130-134 E. LARNED ST.
DETROIT 26, MICHIGAN

Other interesting machine features include: ability to change over quickly from circular to longitudinal welding and back again with a minimum of time loss; provision of larger throat clearance than usual to accommodate bulky work; transformer close coupled to the welding arms to reduce current loss; specially developed copper alloys to insure maximum strength where strength is needed; maximum conductivity where this is important; transformers insulated with mica and fiber glass to withstand effectively the high temperatures sometimes developed in high duty cycle seam welding; triple independent water cooling systems with visible outlets; optional straddle or

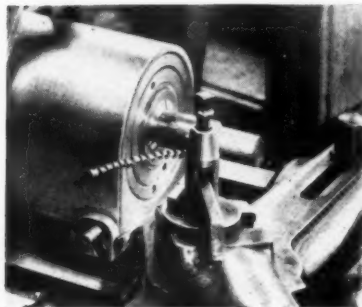
outboard mounted wheel locations; several optional types of wheel drives, etc.

The seam welders may be used either for continuous, water or gas tight seam welding, or for roll-spot welding and may be used for cold-rolled steel, stainless or other alloy steels, aluminum and other non-ferrous alloys as well as various types of coated metals. For further information, write:

Progressive Welder Co.
3050 Outer Dr., Dept. BB
Detroit 12, Mich.

NEW TYPE COLLET SPEED CHUCK

This chuck rotates on a precision ball bearing. It derives its turning power from the spindle of the machine to which it is attached. By the elimination of overhang, heavier work can be done than is normally possible with the conventional type of collet chucks. It is different from the conventional in that it rotates on its own bearings. Other attachable collet chucks depend on the spindle to which they are fastened for their accuracy and rigidity.

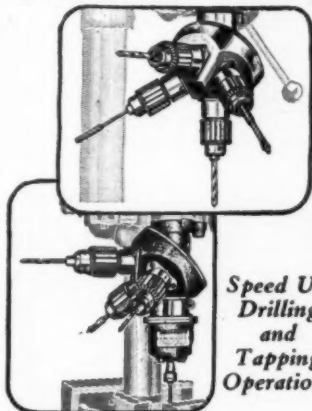


The collet remains stationary while opening and closing, making it possible to maintain accurate length dimensions on parts being machined. The working mechanism of the collet closing device is located between the two precision ball bearings. This longer support between bearings increases the accuracy of the chuck. The chucks are designed in 1" and 2" thru capacities and they are being made to order to

11 HOLES DRILLED
3 DIFFERENT SIZES
and 2 HOLES
TAPPED
IN
25 SECONDS
ON ONE PRESS

SLASH COSTS
WITH

QUADRILL and QUAD-TAPPER



*Speed Up
Drilling
and
Tapping
Operations*

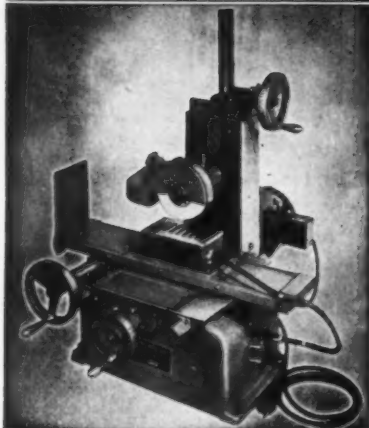
★ You, too, can offset higher wages by getting production costs down! Let QUADRILL (4 position drill head) and QUAD-TAPPER cut your manufacturing costs. Quick as a flash, operator indexes from one size drill or tap to another. No loss of productive time. No need to move part from one station to another. Write today for literature and prices.

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DRILLET CORPORATION

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SANFORD



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A sensitive machine built to rigid standards of accuracy and workmanship specially designed "For the job that fits in your palm."

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SANFORD MFG. CO.

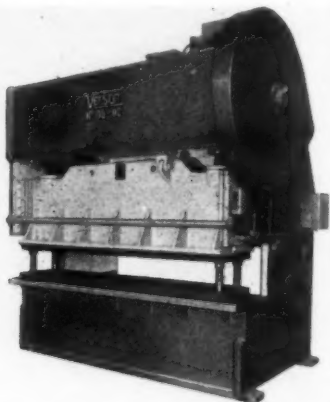
1020-28 Commerce Ave.
Union, N. J.

suit any type of lathe, grinding machine or other rotating spindles. The 1" size uses a standard 5C collet and the 2" size a Zagar No. 310 draw type master collet with No. 6 W&S collet pads. Write:

Zagar Tool, Inc., Dept. BB
23880 Lakeland Blvd.
Cleveland 17, O.

VERSON ANNOUNCES NEW GANG PRESS

To bridge the gap between press brakes and large, heavy blanking presses, The Verson Allsteel Press Co. has developed a line of Gang Presses ranging in capacities from 100 to 350 tons, in bed lengths from 72" up.



These presses are especially designed for blanking, forming, punching, shallow drawing, and multiple jobs whereby a cycle of operations may be accomplished in one handling, thereby effecting real manufacturing economies. Control is by means of electrical push buttons—hand or foot operated—and a selector panel for inching, one stroke, or continuous operation.

For complete details, write:
Verson Allsteel Press Co., Dept. BB
1335 E. 93rd St.
Chicago 19, Ill.

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**GEARS — SPROCKETS
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DY-NAMIC BALANCING to Industry.

250 to 300 ROTORS per day DY-NAMICALLY BALANCED

—on Bear Balancing Machines at Pezillo Pump Co.
Benefits of Dy-Namic Balancing which they report,
can be yours, too, when you use Bear Machines to
balance rotating parts. Select the machine that fits
your need, from the new Bear
Dy-Namic Balancing Manual.



**FREE MANUAL tells how to
BALANCE ALL ROTATING PARTS**

This new Dy-Namic Balancing Manual tells you how you can easily, quickly, economically balance rotors, armatures, crankshafts, and other rotating parts, weighing from 4 oz. to 8 tons. Also tells how Bear Dy-Namic Balancing Reduces Wear on Rotating Parts, Eliminates Noise and Vibration, Improves Efficiency of Finished Product. SEND FOR YOUR COPY, TODAY. Write Bear Mfg. Co., Dept. M-20, Rock Island, Illinois

BEAR STATIC AND DY-NAMIC
BALANCING MACHINES



**Pezillo Pump Co.,
Philadelphia, Pa.**
—reports greater quietness, smoothness of operation and better performance since balancing their rotors on Bear Machines. Approximately a minute and a half required for each rotor. They say Bear Balancing Machines are easy-to-operate, trouble-free, fast in production!

AUTOMATIC CYLINDER FORMING SEAM WELDER

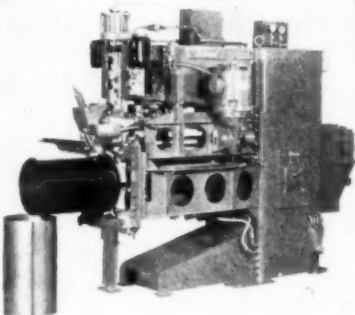
With a forming feature incorporated in several sizes of machine, this high production equipment will process 26 to 16 gauge mild steel cylinders ranging from 11¼" in diameter, 14" long to 22" in diameter, 37½" long, at production rates of 600 to 1500 per hour depending on the length and material thickness of the cylinders.

This automatic cylinder forming seam welder, one of which is now producing pail bodies in a large mid-western container plant, is manually fed. (Automatically fed, if desired). Sheet stock is moved into the forming rolls of the welder and automatically welded and ejected onto a conveyor or mechanical handling system.

An abrasive blast sheet edge cleaner with automatic transfer into welder forming rolls is designed to become a unit of this machine when processing cylinders from hot rolled or rusty steel.

One operator, steel in coils, roller leveller, automatic shear, and automatic cylinder forming seam welder produce

high production of low cost, high quality cylinders. For further information write:



The Federal Machine and Welder Co.
Dept. BB
Warren, Ohio

A NEW CARBIDE TOOL GRINDER

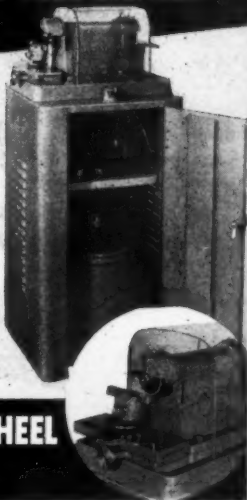
Not Only

\$285.00

- Grind Single Point tools and Inserted carbide blades quickly and inexpensively.
- 9000 RPM spindle uses smaller Diamond wheels.
- Equipped for wet grinding.
- Chipbreaker attachment (standard equipment) extra.

Let us show you how your production can be increased at no cash to you.

Write for Bulletin showing Grinder and complete line of Diamond wheels.



UNITED STATES DIAMOND WHEEL

AURORA CO. ILLINOIS

FOR *Faster* PRECISION FITTING



of Gears, valves, cylinders, bushings, bearings, etc.

Timesaver Lapping Compound is a powdered abrasive prepared especially for applications where fine lapping, perfect control and freedom from embedment (charging) are imperative.

Check these features:

- Absolutely non-imbedding
- Diminishing (self reducing) action
- Becomes totally inert thru use
- Laps all metals from soft babbitt to hardened steel
- 28 years of successful use

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TIMESAVER PRODUCTS CO.

739 W. Monroe St.

Chicago 6, Ill.

INCREASE YOUR CUTTING BETTER THAN 30%

with **MILFORD WAVY SET BAND SAW BLADES**

Yes... it's true... enthusiastic users tell us that 30% increased production on horizontal and vertical cut-off band saw machines IS CONSERVATIVE.

These blades of unique design eliminate ripping of teeth... and cut with greater precision and closer tolerance. One pitch, 10-tooth blades can be used for cutting bar stock, angles and pipe.

Available in the 3/4" 10 and 12-tooth sizes for immediate shipment.

Your own machines are your best proving ground. Test a Milford "Wavy Set" Blade — against the field!

Now individually packed in cartons for ease in handling



Your Industrial Supply Distributors are always ready to serve you for all factory and mill supplies as well as MILFORD WAVY-SET and other blades. Order through them.

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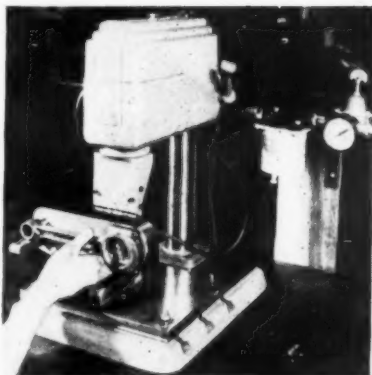
THE HENRY G. THOMPSON & SON CO.

Saw Specialists, Exclusively for
Over 70 Years
New Haven, Connecticut U.S.A.

AUTOMATIC MARKING MACHINE

This new Automatic Marking Machine, called the "Automark," is designed for fast, low-cost marking on light and medium heavy parts in a wide variety of materials, including ferrous and non-ferrous metals, bakelite, plastics, leather and wood. It is adaptable to gold and color-leaf marking on the last four substances. The unit is well suited for light forming and piercing operations. It is widely used in plants for pressing, staking, crimping, and light riveting.

The "Automark" operates pneumatically on standard air pressures maintained in most plants. As many as 4000 parts have been automatically stamped in 1 hour in the production operations of one user. The positioning of the work governs the tripping device which insures accuracy. An electric control releases the stamping ram only when the work is in position. Special work-feeding devices can be installed to make the machine fully automatic.



The unit will mark on flat work or on certain ranges of curved surfaces. The impression depths range from .0005" to .015" or more, depending upon the

CARBOLOY TIPPED SCRAPER BLADES

Especially good for hard alloy iron and extremely hard bronze castings. If you are using Anderson Hand Scrapers it is not necessary to buy complete new scrapers in order to use carboloy tipped blades. Simply remove high-speed blade and slip in the Anderson Carboloy Tipped Blade. Available in three widths.

by *Anderson*

THEY LAST 8 TO 10
TIMES LONGER



Send for Bulletin 9-5

ANDERSON BROS. MFG. CO., Rockford, Ill.

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hardness of materials, and size and quantity of marking type. For additional information, write:

Cadillac Stamp Co., Dept. M-44
2138 Riopelle St.
Detroit 7, Mich.

HARD SURFACING ELECTRODES

The Lincoln Electric Co. is now producing two new electrodes of the coated tubular type for depositing superabrasion resisting surfaces of weld metal. Tubular electrodes are steel tubes in which is contained the hard surfacing alloy in a concentrated form. The alloy is deposited into the molten crater where it is either bonded into a tough iron alloy matrix or alloyed by the heat of the arc with the base metal to create the final hard surfacing alloy.

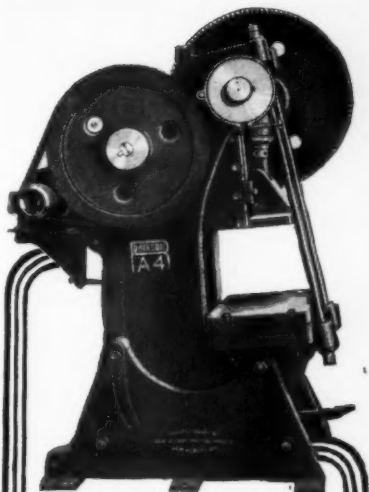
Tungweld-C is a tubular, light coated electrode which contains in the tube coarse particles of tungsten carbide. The particles are deposited by the arc in the weld crater and as the weld solidifies are held in a tough iron alloy matrix.

Tungweld-F is a shielded arc tubular electrode containing fine particles of tungsten carbide. It is for use on earth cutting tools but produces a smoother, thinner and sharper edge than the rough edge of Tungweld-C. The tungsten carbide particles are so small that they will not stick out like teeth as do the coarser particles, and are so close together that they are not undermined by the abrasion of a blast of muddy sand.

Tungweld - C and Tungweld - F are available in 14-inch length in 1/4-inch size, packed in 5-pound containers. Write:

Lincoln Electric Co.
Dept. BB., Cleveland, O.

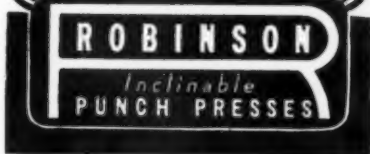
Magline, Inc., Pinconning, Mich., makes a barrel truck of welded tubular construction, an interesting item which illustrates the flexible design characteristics of magnesium and one which is being considered for mass production and nationwide marketing.



The ROBINSON *Inclinable* **PUNCH PRESS**

The new and improved Series A Robinson Punch Press is noted for safe, dependable operation. Sturdily built and employing finest construction features, a Robinson Series A offers years of trouble-free operation at minimum maintenance cost. Five sizes now available for immediate delivery.

New Albany Machine Mfg. Co.
NEW ALBANY, IND.



**"So you think
oil is oil..."**



...says
"CHIP" WRIGHT

"Personally, I've found that cutting fluids can make or break most jobs. That's not hard to understand when you consider that speeds, feeds, materials, tolerance and finish requirements all influence the application of a cutting fluid. 'Just oil' simply cannot give you the performance you need. Fortunately, qualified cutting oil people make these problems their full time business. I've learned it pays to take advantage of their experience and service, plus the facilities no individual user can match."

Chip

Since 1865, D. A. Stuart Oil Co. has devoted its entire interest to Cutting Fluids and Industrial Lubrication. Be sure to get Stuart's handbook, "Cutting Fluids for Better Machining."

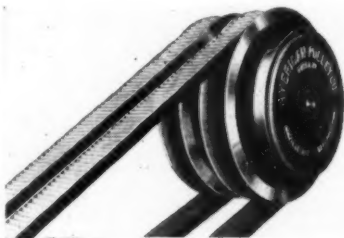


D. A. Stuart Oil Co.
EST. 1865 LIMITED

2739½ South Troy St., Chicago 23, Illinois

**ADJUSTABLE SHEAVE
ELIMINATES FREEZING**

Frozen adjusting mechanisms need no longer be a drive problem. With a new wide-range, adjustable-diameter drive, the American Pulley Co. announces a sheave that provides permanent adjustability. New construction feature of the sheave is the rubber-lagged hub upon which the flanges are mounted. Bonded to the steel hub of the sheave, the rubber section eliminates freezing by acting as an insulating cushion between the flanges and the hub of the sheave. It further serves to cut out noise and vibration.



Each individual flange, as well as the entire assembly, is dynamically balanced. The adjusting mechanism provides a positive means of shifting all flanges simultaneously. A single locking screw prevents flange movement while sheave is in operation.

The sheaves are made in two and three grooves with pitch diameter variation of 5¼" to 10". The adjustment for speed variation is made while the drive is stationary. The sheaves are designed to utilize multiple "R" section V-belts. They will handle loads up to 15 horsepower. For information, write:

**The American Pulley Co., Dept. BB
4200 Wissahickon Ave.
Philadelphia 29, Pa.**

**NEW LIQUID WAX USED IN IMPACT
EXTRUSION PROCESS**

A new liquid wax for use as a lubricant in the manufacture of metal items by the impact extrusion process has been developed by the makers of

10 TIMES OUT OF 10 . . . ←

NICHOLSON VALVES

ARE THE EQUAL OF ANY OTHER CYLINDER CONTROL

And 10 times out of 10 we believe Nicholson can furnish a standard or special valve to fill your need. This combination of dependable service and completeness of line is a logical reason for the increasing standardization on Nicholson valves.

*Standardize on Nicholson Valves
to Lower Maintenance Costs*

You can economize on spare parts as well as cut "down time" by their trouble-proof features. Metal combinations for specific needs.

CATALOG 546.

W. H. NICHOLSON & CO.

117 Oregon St., Wilkes-Barre, Pa.



Manual,
foot, sole-
noid, motor types
for all mediums.
Pressures to 5000
pounds.

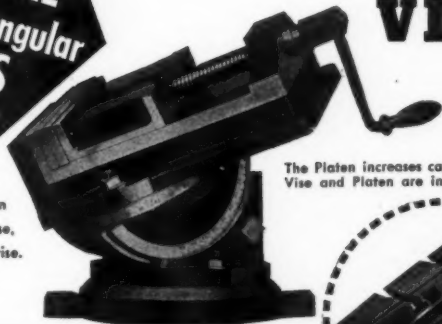


SAVE TIME
on intricate, angular
SET-UPS

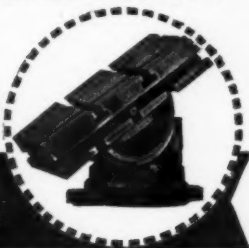
Multi-Swivel VICE

Fully universal . . .
three swivels simplify the
setting of compound angles.
Parts interchangeable . . . can
be used as a plain flanged vise,
a swivel vise or multi-swivel vise.

Write for
name of
nearest distributor



The Platen increases capacity of the unit.
Vise and Platen are interchangeable.



MASTER TOOL CO.

161 HIGH STREET • BOSTON MASS.

Johnson's Wax. It is being marketed as Johnson's LW No. 20 Wax.

In impact extrusion a waxed metal slug is placed in a die and struck a single, hard blow with a punch, causing the metal to flow out of the die and shoot up the sides of the punch to form a perfect tube. Typical articles produced by this process are collapsible tooth paste tubes and condenser cans.

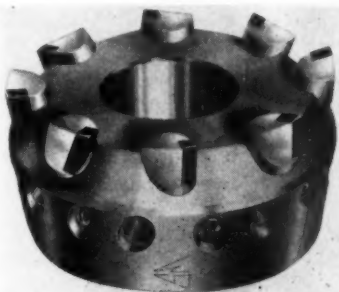
The heat generated in the process and the need for freedom of flow require an efficient and rugged lubricant. Johnson's LW No. 20 Wax meets these requirements, giving an even coat which remains in place under the terrific heat and does not dissipate itself, cutting the number of rejects due to scoring caused by imperfect lubrication.

Johnson's LW No. 20 Liquid Wax can be applied to slugs before extrusion by dipping or tumbling. It provides a dry finish that is easy to handle and sanitary. Further information can be obtained by writing to:

S. C. Johnson & Son, Inc., Dept. BB
Racine, Wis.

INSERTED TOOTH CUTTERS

Inserted tooth cutters embodying new techniques in milling cutter design have been developed by the Wendt-Sonis Company, Hannibal, Missouri.



Equipped with right hand cutting blades as standard, the same Wendt-Sonis cutter body can be used as a left hand cutter by inserting a set of left hand style blades. Blade holding fix-

Maximum Production . . . in Chucking and Indexing



With the new Dearborn Automatic Indexer connected to a Dearborn Chucking Fixture: chuck is closed automatically; indexed the required number of times automatically; chuck is opened automatically; piece is knocked out automatically.

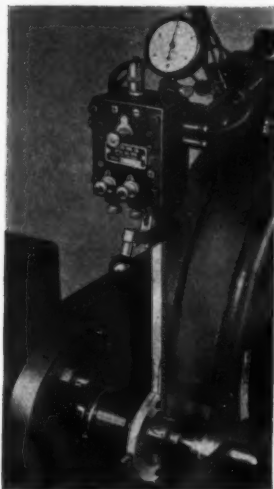
When used with the Dearborn Degree Indexing Fixture it can quickly be set to index any number of degrees from 30° to 90° at one indexing and then knock out, or it can be set to index from no degrees to 90° and then not knock out.

WRITE FOR FURTHER INFORMATION

J. W. DEARBORN

ANSONIA, CONN.

NO. 177 AUTOMATIC GRINDING SIZE CONTROL



Now you can have automatic size and quality control on your cylindrical grinders. Tolerances of .00005 maintained through long and short runs.

Model No. 177 (when grinders are adaptable) will control sizing automatically, eliminating human element.

One operator can run two grinders or one lathe and one grinder. There are many setups possible and practical.

Our engineers will assist you.

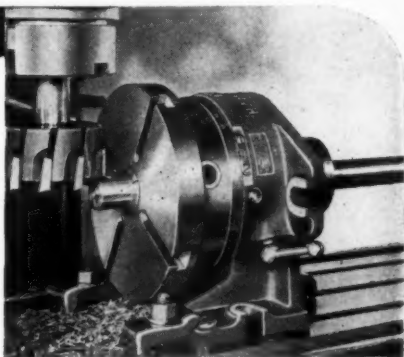
FOSTER ENGINEERING COMPANY
4200 WOODWARD AVENUE
ROYAL OAK, MICHIGAN

SUPER-SPACER

FOR MILLING

The uses of the Super-Spacer in horizontal and vertical milling operations are unlimited. Here the Super-Spacer, mounted with a face plate and draw-in collet combination, shows its adaptability for milling bar stock. Investigate your present milling methods and see if your shop can't profit by the speed and accuracy of the Super-Spacer.

For complete details write Dept. S7



Special Machinery

HARTFORD SPECIAL is equipped to build from prints almost any type of special machinery, parts or operations. Our facilities give your shop an added capacity. Bulletin E-200 gives complete list of our Machinery Equipment and capabilities. We'd be glad to send you one.

HARTFORD
Special

THE HARTFORD SPECIAL MACHINERY CO. HARTFORD 5, CONN.

ture of the cutters is designed for quick and accurate blade setting. Blades are held securely in position. Rigid cutter bodies are precision built, with added weight to insure maximum power in the cut. Each style cutter has the type of mounting best suited for safety in operation and accuracy in machining. "C" Arbor mounting for 6" cutter and direct mounting for 8" cutter. For further details, write:

Wendt-Sonis Co., Dept. BB
Hannibal, Mo.

SUPERIOR "BIG BULLY" AIR HAMMER

A new air hammer, called the "Big Bully" has been placed on the market by Superior Mfg. Co.

The "Big Bully" delivers 8,000 blows per minute, and is a complement to the well-known "Bantam Bully" Air Hammer, is designed for lighter weight cutting, chiseling jobs, while the "Big Bully" is larger, more powerful and designed to handle heavier jobs of chipping, scaling, chiseling, grooving, etc., in foundries and factories.

The handle of the device is equipped

with a pistol grip which releases the other hand of the operator to hold or turn the work-piece. By varying the finger pressure on the trigger, the operator can regulate the power from a light touch to full-strength 8,000 blows per minute. According to the manufacturer, no large-volume compressed air equipment is needed, for full speed and power of operation can be attained on less than 7 c.f.m. at 80 p.s.i.

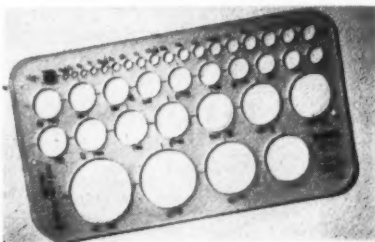
The "Big Bully" is available with accessories such as a routing chisel, flat scaling chisel, flat chisel, star drill, etc.

Literature is available by writing:

Superior Mfg. Co.
1302 Ontario St.—Dept. 12
Cleveland, Ohio

USEFUL CIRCLE TEMPLATE FOR DRAFTSMEN

Rapidesign, Inc. announces the new No. 40 Circle Template for use in all fields of drafting and delineation. This new template is the answer to the problem of quick, accurate, small size circles. Thirty-nine circles are grouped in progressive sizes with increments in 4ths, 32nds, 16ths and 8ths of an inch.



The No. 40 Circle Template is made of .030, matte finish, mathematical-quality, cellulose nitrate sheet. All circle cut-outs are precision milled with allowance for pencil point to give the utmost in accuracy. Each circle is clearly marked and all have center guide lines. Printing is on negative side to prevent wearing off. Actual size is 4" x 7 1/4". Write:

Rapidesign, Inc., Dept. BB
P. O. Box 592
Glendale, Calif.

*The very best
facilities for*

STAMPINGS

In Small Lots

DAYTON ROGERS
Manufacturing Company

Minneapolis (7), Minn.

To Increase Production

and to improve efficiency
use Butterfly Filing and
Die Making Machine

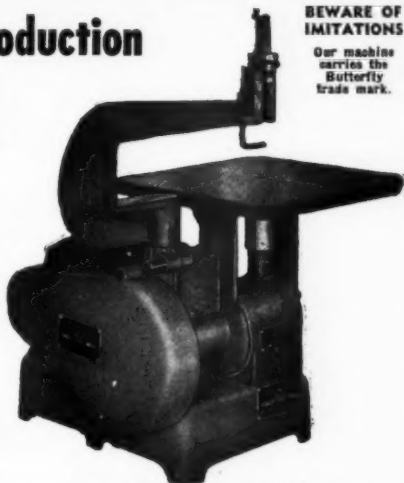
This is a powerful machine, for heavy or small precision work in use all over the world: Airplane Factories, Ammunition Plants, Toolrooms where fast production is desired. 4 Models, No. 16, No. 14, "EL" and Model "D". The larger the model, the larger the stroke and therefore more filing is performed, furnished with or without pedestals.

Constructed as per Specification of U.S. Naval Aircraft Factories.

HARVEY MFG. CORP.

161 GRAND ST., NEW YORK

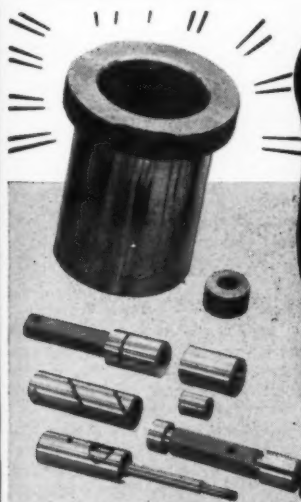
Phone CAnal 6-5170



**BEWARE OF
IMITATIONS**

Our machine
carries the
Butterfly
trade mark.

Registered U. S. Patent Office



DRILL JIG

Bushings — Gages

ECONOMICAL — ACCURATE

IN STOCK, ready for immediate delivery, all A. S. A. STANDARD types and sizes. Exceptionally fast delivery of NEW GAGES and Gages salvaged by **HARD CHROMIUM PLATING**.

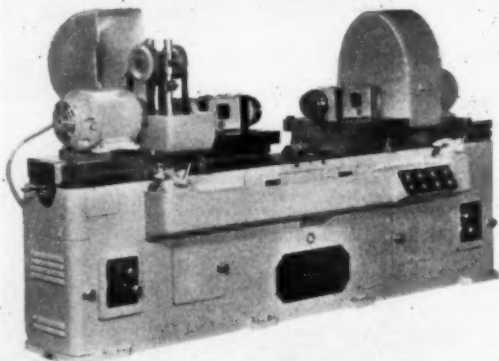
*Bulletin and Price Lists
sent promptly upon request.*

Economy **TOOL & MACHINE CO.**

1829 S. 68th St., Milwaukee 14, Wis.

SIMPLEX PRECISION BORING MACHINE

The Simplex Machine Tool Division of Stokerunit Corp. has recently placed a completely new Precision Boring Machine in production. Known as Model 2UA, this machine incorporates a new sealed lubrication system in the precision boring heads, eliminating the entrance of foreign matter and resulting in much cooler operation. The massive one-piece bed design assures accuracy in precision boring and provides greater rigidity on heavy roughing operations. Bridges have been designed to permit greater use of multiple head installations, also many modifications in head mounting, thus



increasing the all around adaptability of the machine. New coolant troughs give adequate protection even when the operation calls for flooding the part with coolant. The photo shows the belt guard for the left head opened to illustrate the simplicity of the spindle drive details.

The Unit type hydraulic systems which isolate vibration and heat from the machine proper have been retained. All hydraulic piping is manifolded to facilitate the easy removal of the entire hydraulic systems for cleaning and servicing. For complete information about this new machine, write:

The Simplex Machine Tool Div.
Stokerunit Corp., Dept. BB
Milwaukee, Wis.

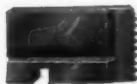
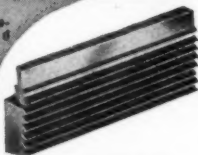
CHASERS

STANDARD: OR MADE
TO YOUR SPECIFICATIONS

To fit the Langle, Geo-
metric, Mureby, and
H & G Dieheads

QUALITY CHASER
OFFERS YOU:

1. Master Work-
manship
2. Top Perform-
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3. Longer Threading
Life
4. Standard
sizes from
1/16" to 1/2"
5. Special or
odd delivery.



Several Good Territories
Are Available
PHONE: Jordan 4-6399

WRITE FOR FOLDER

QUALITY

CHASER CO.

24000 Stephenson Hwy
HAZEL PARK, MICH.

AUTOMATIC END SEAMER

A new high-speed automatic end seamer for square and irregular-shaped cans, the first machine of its kind ever offered for general sale, has been announced by the Lima-Hamilton Corp.

Called the Hamilton-Kruse Model No. 150, this is a completely automatic four-head unit with four round rollers on each head. In operation, the cans remain stationary on the base plates during the seaming.

Model 25 Hi-Duty
Marking Machine



MARK YOUR PARTS

Permanently

PART NUMBERS
HEAT NUMBERS

CATALOG NUMBERS
SERIAL NUMBERS

PATENT NUMBERS

MANUFACTURER — INSTRUCTION DATA — INSPECTION
Positive, Permanent marking on your products assist prospects to order. Makes it easier to buy—new, repeats and repairs. Gives you a definite record of pertinent data on each part produced.

The Pneumatic marking machine illustrated is our HI-DUTY model 25 general purpose tool for short runs or production work. It operates from your shop air line and is one of numerous models built to produce neat, permanent markings quickly on metal fabrications.

We will be happy to make specific recommendations upon receipt of samples or prints of parts to be marked, showing approximate lettering, its location on the part, with required hourly production.



MARKED PARTS ADVERTISE
IN THE RIGHT PLACE, AT THE RIGHT TIME

*Send for complete catalog of our full line
of marking Tools, Machinery and Equipment.*

GEO. T. SCHMIDT, Inc.
1802 W. Belle Plaine Ave. Chicago 13, Ill.

SPRING & PRESSES

**POWER AND FOOT
OPERATED**

For riveting, staking, stamping and similar operations on small light parts. Constructed to compensate for variation in thickness of the work and to deliver a **UNIFORM BLOW AT EVERY STROKE.**

M-110 (illustrated) motor driven to eliminate fatigue factor of foot operated press—similar press M-130, equipped to operate by compressed air.



OTHER T & F MACHINES
Duplex Spline
Millers — Medium Duty and
High Speed
Sensitive Drilling Machines.

Send for Bulletin



EST. 1834

THE TAYLOR & FENN CO. HARTFORD 1, CONN.

Model 150 is built by Lima-Hamilton's Hooven, Owens, Rentschler Co. division at Hamilton, Ohio, and is equipped with automatic body and end feeds, a complete set of seaming parts, and its own motor and control.



The new end seamer is distinguished by unusually quiet operation and its features include low speed heads, exceptional ease of adjustment, and automatic lubrication. Its installation will bring about a step-up in the output of any line, with a continuous can flow and firm maintenance of settings.

Full details from:
Lima-Hamilton Corp., Dept. BB
60 East 42nd St.,
New York 17, N. Y.

GAS FIRED UNIT HEATERS

New gas fired unit heaters, series C, that feature cast iron construction in both the heat exchanger and the combustion chamber have been placed on the market by Automatic Gas Equipment Co.

Cast iron is used for the heat exchanger and combustion chamber. They are cast in one piece, and the extended heating surface fins on the heat exchanger are cast integral.

Heaters have been designed to con-

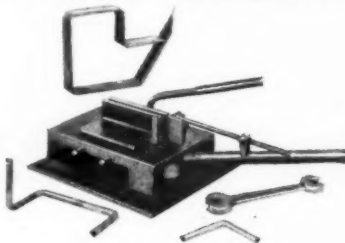
sume exactly the right amount of air to support perfect combustion but without permitting an excess of air to lower heating efficiency. This is accomplished by means of a built in draft hood which absorbs all excessive chimney action and thereby conserves heat. The heater does not depend upon forced draft from the fan for either the primary or secondary air supply. For this reason there is no possibility of variation in the air supply to the burners resulting from changes in fan speed or louver adjustment. By the use of adjustable horizontal louvers, warm air can be directed to any desired level.

A tested and proved safety pilot is used on these heaters to automatically turn off the gas if the pilot light goes out or if it burns too low to insure perfect ignition. The draft diverter is absolute protection against any possible down drafts through the chimney. Write:

Automatic Gas Equipment Co.
301 Brushton Ave., Dept. BB.
Pittsburgh 21, Pa.

WHITNEY-JENSEN PRODUCTS 30 YEARS EXPERIENCE

NO. 52 BENDER



Capacity—Mild Steel

$\frac{1}{2}$ " Round Solid Bars

$\frac{1}{4}$ " x 2" Flat Bars

$\frac{1}{4}$ " x 2" Notched Angle Iron

WHITNEY METAL TOOL COMPANY

115 FORBES ST.

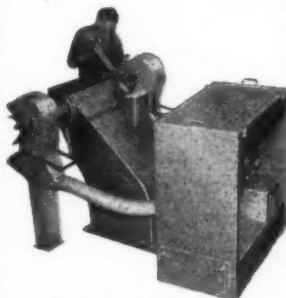
ROCKFORD, ILL.

* DUCTLESS DUSTKOPS can usually be installed in twenty minutes.

STOP DUSTS

HOW? ... with **DUSTKOP**

WHEN? ... within 20 minutes*



Model 1150 illustrated

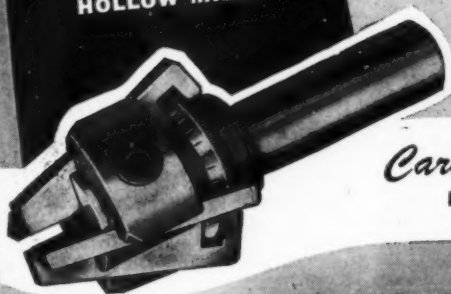
■ DUSTKOP stops abrasive and fire-hazardous wood, rubber and similar combustible dusts. DUSTKOPS are firesafe. (Built of steel and non-inflammable spun glass). DUSTKOPS have high suction, big dust storage capacity, with space-saving compactness plus high efficiency dust separation. Unit-type DUSTKOPS save power: operate only when needed. Complete line of DUSTKOPS for all dusts.

Send Us the Details of Your
Dust Problem _____

AGET-DETROIT CO.

205 Main at Washington
Ann Arbor, Michigan

Kutmores
HIGH SPEED
ADJUSTABLE
HOLLOW MILLS



Designed for modern production requirements. Saves time, effort and motion. Has a two way micrometer adjustment with locking device to assure absolute cutting accuracy.

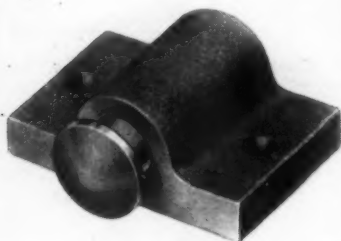
Kutmores Hollow-Mills may be had with straight or taper shanks, high speed or Carbide Tipped blades. Insist on Kutmores for accuracy, speed and economy. Prompt delivery. Write for Catalog No. 15.

Carl Wirth & Son

1625 CLINTON AVE. N.
ROCHESTER 5, N. Y.

VLIER SPRING STOPS

Vlier Spring Stops have been designed to serve the same purpose as the Vlier Spring Plungers (see p. 219, August 1948 MACHINE and TOOL BLUE BOOK), in specific cases where



no wall sections are available for threaded mountings. These stops provide a case hardened steel plunger with a radiused nose $9/16$ " in diameter. The plunger works with a $3/16$ " stroke in

WESTLEN REELS

*Adjustable
Self Centering*

for feeding flat and wire coil stock up to 12" in width, with a maximum coil weight of 500 lbs. The inside diameter of coil is adjustable, ranging from 11" to 20". The outside ring diameter on standard machines is 28" but larger rings may be secured if desired. Coils may be centered by a few turns of adjustment wheel, and special features eliminate tipping and backlash. Machine is equipped with brake and ball bearings. Reel is quickly convertible to either vertical or horizontal position. Adjustable spider prevents kinking or crossing while unwinding.

Send for literature

The RULETA Co.
27 WARREN ST. NEW YORK 7.



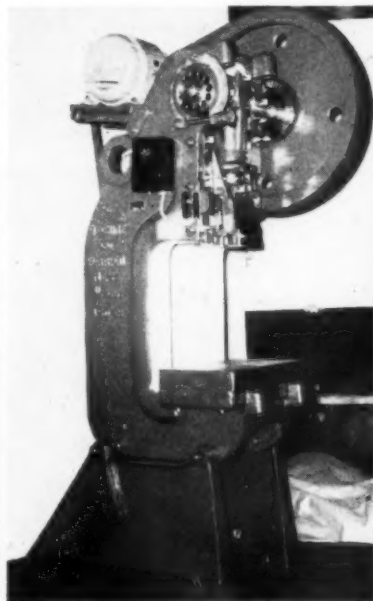
a special cast iron housing, equipped with flanges jig-drilled for bolting to fixture bases. Vlier Spring Stops provide an end pressure of fourteen pounds, are rust-proofed finished and are packed six to a box.

Further details, specifications and information relative to typical or specific applications, will be furnished by the manufacturer.

Vlier Manufacturing Co., Dept. BB
4552 Beverly Blvd.
Los Angeles 4, Calif.

NEW PERKINS POWER PRESS

A new model power press, No. 450 B, has been announced by Perkins Machine Co. Model 450 B has a special high die space of 20". It has a capacity of 35 tons and can be furnished



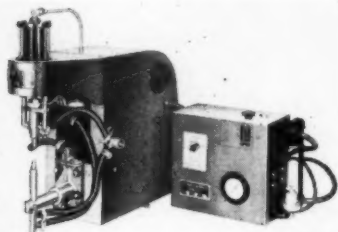
either plain or geared. The weight of the plain press is approximately 3,000 lbs.; stroke of piston is 2" standard and 4" maximum. The width of

the bed is 14" and the length of the bed is 21½". Weight of the geared press is approximately 2,950 lbs., with a gear ratio of one to five. For bulletin, prices and delivery write to:

Perkins Machine Co., Dept. BB
Warren, Mass.

WELDEX BENCH TYPE SPOT WELDER

For joining small metal parts, Weldex Inc., has introduced a new, fully automatic 7½ KVA bench type spot welder. The welder, model 752-PB, is precision-engineered to handle light non-ferrous metals of the same or dissimilar alloy and thickness, on a high speed production basis and will also give



efficient, low-cost operation on ferrous metals up to two thicknesses of 14 gauge CRS or equivalent. High electrical efficiency is assured through superior transformer design coupled with a shorter secondary welding circuit.

In addition to air strainer, regulator, gauge and lubricator, standard equipment includes: a built-in four-step transformer tap changing switch; single acting air cylinder; magnetic long-life contactor; and electronic timer. Regularly furnished for 220 volt, 60 cycle, single phase A.C. operation, this model is also available in 380 or 440 volts on special order.

Standard throat depth is 4½". Complete with separate control cabinet the whole unit occupies less than two square feet of bench space.

Price information and other data are available by writing to:

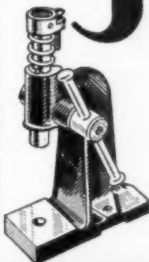
Weldex Inc., Dept. BB
7325 McDonald Ave.
Detroit 10, Mich.

HIGH SPEED SCALING HAMMERS

Two new high speed and powerful scaling hammers, Master Models M-205 and M-206, are available from Master Pneumatic Tool Co. These hammers can be used for such diverse scaling operations as: removal of splatter and excess metal after welding; peining and beading; removal of rust, scale paint, and soot; core breaking, gouging in pattern work, etc. Easy feathering of throttle control, with a sure grip body contour, permits the operator to control his work better. Has a complete self seating type main valve which seats perfectly for the life of the valve. Positive locking device of backhead keeps valve mechanism sealed against air leakage and dirt. A simple chisel retaining sleeve takes but three seconds for change of chisels and allows the positioning of chisel in four directions. For further information write:

Master Pneumatic Tool Co.
Dept. BB, Orwell, Ohio.

HAND } MIDGET Arbor PRESS



For assembling operations, and adapted for light metal and plastic cut-off, with return spring and adjustable stop screw.

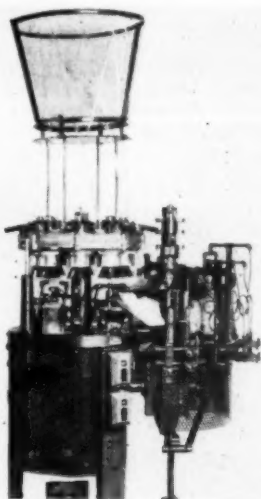
Because of its few parts accurately made, it is unusually sturdy for its size and compactness. Every part has been machined accurately from special tooling, guaranteeing perfect performance.

Clearance under spindle is 3"; stroke length is 1 13/16". Diameter of work which can be handled measures 2 1/4".

TUNSTEAD MACHINE & TOOL CO.
15 STANDISH AVENUE
WEST ORANGE, NEW JERSEY

KAHLE AUTOMATIC PRE-DRESSED FLARE MACHINE

A new automatic, pre-pressed flare machine, successfully combining flare making and flare stretching, has been developed by the Kahle Engineering Co. This unit is an important contribution to the electrical and electronic fields. With a productive capacity of 2400 flares per hour, Kahle's fully automatic machine delivers the pre-formed flare without intermediate handling. The pre-press attachment picks up the flare automatically at the cutting position, eliminating tumbling and track transfer, at the same time dispensing with cooling and reheating processes. The pre-press attachment, with 12 positions on the turret, is provided with either a stretching mechanism, a pressing mechanism or both. Indexing is by barrel cam and roller, totally enclosed in oil, the same as on the flare machine itself. The Kahle Automatic Flare Machine is fully adjustable for precise variations in diameter, length, press width, press thickness, etc. Descriptive



ALMOND DRILL CHUCKS



Maximum gripping power with
extreme accuracy and long life.

Write for Catalog

T. R. ALMOND MFG. CO.
ASHBURNHAM, MASS.
U. S. A.

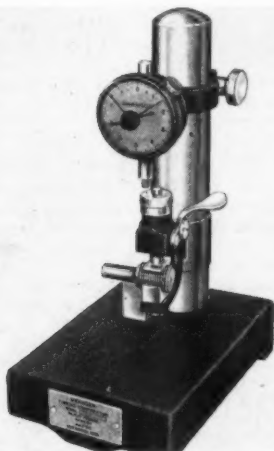
literature is available upon request to:

Kahle Engineering Co., Dept. BB
1313 Seventh St.
North Bergen, N. J.

SWANSON THREAD COMPARATOR

The new Swanson indicator works visually to accepted ring gage tolerances. A pair of anvils, used with each unit, will handle one thread size to check all four thread classes, including two-step type threads. Indicator is equipped with tolerance hands and is graduated in tenths of thousands. The complete gaging unit may be removed by loosening set screw at top of shaft under dust cap for change in size setting. Positive swing stop locates anvil unit in correct reading position; operator can tell at a glance if thread meets required specifications. The thread checking unit swings on thrust ball bearings, adjustable to compensate for wear. The gage unit swings

away from indicator, as shown in the illustration. For further information, write:



The National Automatic Products Co.
23 Whiting St., Dept. BB
New Britain, Conn.

MARSHALL AIR DIE STOCK

An air hardening tool steel is now available from Marshall Steel, Lisle, Ill. This steel shows less size change, and offers greater safety in hardening than other grades, according to its manufacturers. Greater resistance to wear and abrasion is a further feature of Marshall's Air Die Stock, which is furnished ready to use on the layout bench.

Wet grinding is carefully performed to assure a clean ground finish of virgin steel.

A new 4-page folder lists 76 sizes of Air Die Stock, as well as 203 standard sizes of Oil Die and 162 of Water Die Stock. This is most complete, and comprises the largest range of sizes available for immediate shipment. Request copies from:

**Marshall Steel, Dept. BB
Lisle, Ill.**

OUR EFFICIENT TOOL DESIGNING

*means
better production
at a lower cost*

Efficient tool designing in post-war's competitive production is a "must". Our experience guarantees you tools — designed for economy of operation, resulting in your increased production at lower costs.

COLUMBUS DIE TOOL
and Machine Co.

930 CLEVELAND AVE., COLUMBUS 1 OHIO

Steel Adjustable Compartment Shelf Drawers



Style 90 BCH

Immediate Shipment

For handling and storing small quantities of small parts. Slotted on 1" centers to accommodate dividers. Label holder on front. Pull handle on front only. Finished in baked green. Dividers furnished at slight extra cost.

OTHER SIZES AND STYLES AVAILABLE

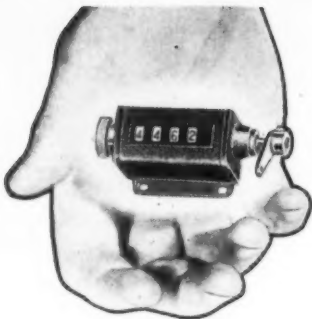
91 BCH $3\frac{1}{2} \times 11\frac{1}{2} \times 2\frac{1}{2}$ Green Finish—\$2.00 ea.
92 BCH $3\frac{1}{2} \times 17\frac{1}{2} \times 2\frac{1}{2}$ Green Finish—\$1.00 ea.
93 BCH $8\frac{1}{2} \times 11\frac{1}{2} \times 2\frac{1}{2}$ Green Finish—95¢ ea.
94 BCH $8\frac{1}{2} \times 17\frac{1}{2} \times 2\frac{1}{2}$ Green Finish—\$1.15 ea.

SEND FOR CATALOG

All Prices F.O.B. Philadelphia Plant

Phone — Wire — Write

BAY INC. 3003 No. 16th St.
Philadelphia 32, Pa.
Telephone BALdwin 9-1805



You asked for it . . . HERE IT IS!
MODEL "Y" Reset COUNTER
For STROKE and ROTARY Application

This new Model "Y" Productimeter has been built to meet the insistent demand for a small, accurate, compact reset counter. It is designed particularly for application where high speed counting is involved.

It's tiny, but it's rugged . . . and precision built to give you years of service. The Model "Y" Productimeter is easily adaptable as an integral part of office machines, laboratory equipment, and various types of production machinery.

There are over 300 other standard types of Productimeters to provide dependable count and accurate control for every operation. They help you uncover losses . . . obtain efficient use of man hours in your plant.

Send for Catalog Section No. 31 for information on the "Y" counters . . . and Bulletin No. 100 for the general line.

DURANT MANUFACTURING COMPANY

1928 N. Buffum Street
 Milwaukee 1, Wisconsin

128 Orange Street
 Providence 3, R. I.

Representatives in Principal Cities

PRODUCTIMETERS

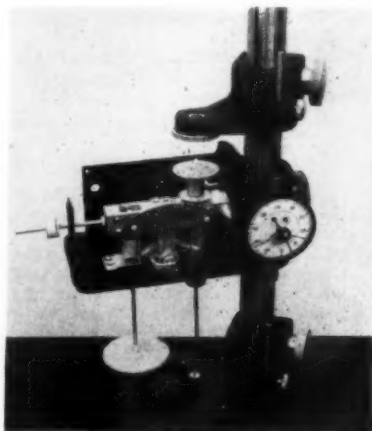
SINCE 1879

Speedometers of INDUSTRY

**COIL SPRING INSPECTION EXPEDITED
 BY NEW LOAD-TESTER**

An improved load-tester for manufacturers and users of small springs provides high speed, accurate testing of coil springs which modern statistical inspection requires. The new machine will test from 50 to 200 springs, with an accuracy of one part in 2500 at maximum load, in from 15 min. to an hour. It will handle loads of up to 5 lbs., and spring lengths up to 12".

The new Model 217P was designed by the Hunter Pressed Steel Co., makers of precision springs, and is now in production. It is equally adapted to the go-no-go or the frequency distribution techniques of statistical inspection. The machine's convenience contributes to its operating speed; a minimum of motions is required of the operator. To insure accuracy, the design eliminates errors chargeable to beam angle, beam-restoring forces and torsional effects.



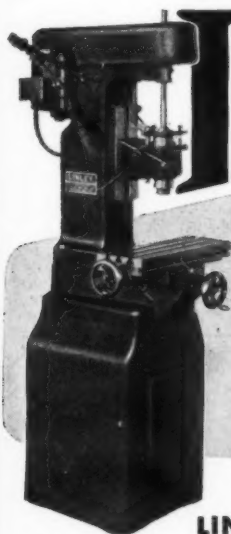
Strength without loss in precision is attained by replacing the usual knife-edge bearings with small precision ball bearings which act as fulcrums for the solid steel weighing beam. For fast, accurate reading, length measurements are recorded on a dial. This is made possible by use of adjustable stainless

SAVES TIME — MAKES MONEY **MARSHALLTOWN THROATLESS SHEARS**

CUTS ANY SHAPE
CUTS ANY SIZE
CAPACITY UP TO 1/4" STOCK

Here's the shear that offers best performance features. Cutting speed 6' per minute. High grade tool steel cutters. Write today for details. Prompt shipment.

MARSHALLTOWN MFG. COMPANY
900 Nevada Street Marshalltown, Iowa



LINLEY

MILLER AND JIG BORER

Handles a wide variety of tool-room jobs with speed, accuracy, efficiency... die work, jig and model making, drilling, reaming, milling. Releases larger machines for work better suited to their capacities. Easy set-up, quick changeover... velvet-smooth feed, eight spindle speeds from 275 to 4250 rpm... simple, direct micrometer setting.

**FOR COMPLETE INFORMATION,
WRITE FOR BULLETIN.**

**LINLEY BROTHERS CO., 663 STATE ST. EXTENSION
BRIDGEPORT 1, CONNECTICUT**

steel rods attached to compression and extension heads. The dial indicator has a 1" range, with .001" graduations. For complete data on this instrument, write:

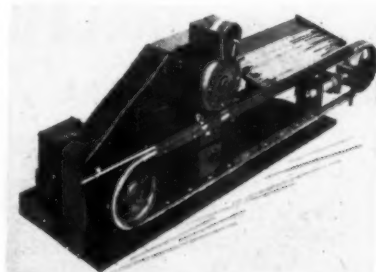
Hunter Pressed Steel Co.
Dept. BB
Lansdale, Pa.

PANNIER AUTOMATIC METAL MARKING MACHINE

Welding rods, solder bars, short-length tubing and similar ferrous and non-ferrous products of from 1/8" to 2" diameter can be printed automatically with a new motor-driven marking machine announced by The Pannier Corp. The Universal Marking Machine, No. C-1055-A, handles uniform and irregular lengths from 2" to 24". It prints continuously or intermittently as desired at 72 feet per minute. It prints in perfect register, thus correctly marks bar recesses.

Powered by a 1/4 h.p. motor, the machine is equipped with a quick-change printing wheel synchronized with a belt conveyor. Automatic, interior-feed ink fountain and adjustments for wear

are included. A choice of dovetail rubber wire dies, quickset rubber dies, or interchangeable National rubber type is offered.



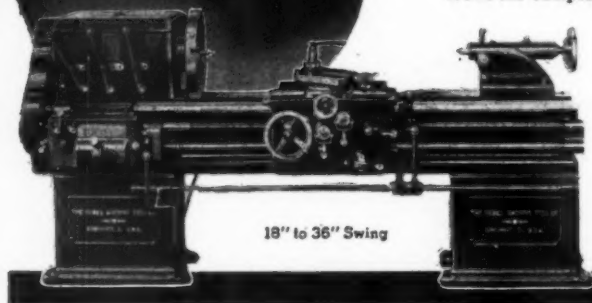
The new Pannier unit is 44" long, 14" wide and 18" high. Bulletin C-1055-A, giving complete specifications, is available on request.

The Pannier Corp.
203 Pannier Bldg., Dept. BB
Pittsburgh 12, Pa.

NEBEL *Geared Head Lathes*

● Simplicity in design, rigid construction, accuracy, and ease of operation are outstanding features of Nebel Lathes. They possess all the latest improvements including Timken Bearings—Self Oiling Headstock—Chrome Nickel Shafts—Quick Change Gear—Double Wall Self Oiling Apron—Quick Action Apron Levers—Thread Chasing Dial.

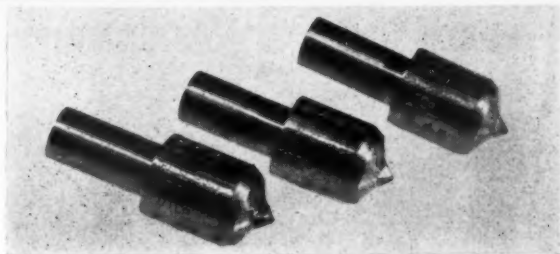
Write for complete information.



18" to 36" Swing

**THE
NEBEL
MACHINE
TOOL CO.**

CINCINNATI 25,
OHIO



**\$24.00
PER
KARAT**

3 GOOD REASONS WHY
 3000 PLANTS IN 48 STATES
 USE RE-SET-ABLE LOC-KEY-SET
DIAMOND TOOL COMPANY, Not Inc.
 INDUSTRIAL DIAMONDS
 SHELDON M. BOOTH, PRES.
 938 EAST 41st STREET, CHICAGO 15, ILLINOIS
 LONG DIS. PHONE AT5-1094 CHGO.

Severance

**TUBING CUTTER GROUP - FOR FAST DEBURRING OF EVERY
MACHINEABLE TYPE TUBE ...**

**TUBE DEBURRING
CUTTERS (Standard)**



18 Standards in H.S.S. and
Cemented Carbide

ADJUSTABLE TYPE



Adjustable from 1/2" -
2-1/2" O.D. — for short runs

**TUBE CHAMFERING
MILLS**



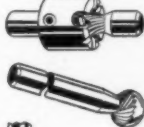
23 sizes from 3/16" - 2-1/2"
O.D. — Chatterless

**SOLID TUBE
DEBURRING CUTTERS**



16 sizes from 1/4" - 1-5/8"
O.D. — H.S.S. and Carbide

**SPECIAL
TUBING CUTTERS**

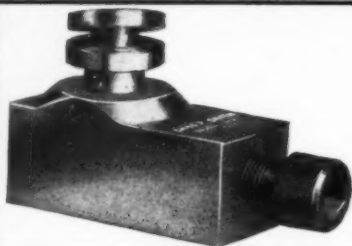


From light hand-deburring up to close tolerance deburring, chamfering, flaring . . . For working non-ferrous metal, steel (including stainless) and plastic tubing . . . For combining reaming, sizing or flaring with end facing and deburring . . . Whatever the operation or material, Severance HSS and Cemented Carbide Tube Deburring Cutters are TOPS in performance — long life — economy.

COMPLETE REGRINDING SERVICE BY NEW TOOL CRAFTSMEN SAVES YOU MONEY!

SEVERANCE TOOL INDUSTRIES INC.

722 IOWA STREET
 SAGINAW, • MICHIGAN



Charles F. Smith & Company

Manufacturers of

"SET-UP-JACKS"

(packed 4 to a set)

These jacks are used in setting up work on any machine where accuracy is necessary and saves 75% in time. Extra cap for angles will take 15 degrees. Holds weight of 1000 lb. (ea.). Have a large base so will not tip. These are hardened throughout. Easily adjusted with a standard Allen wrench.

Write for literature and prices.

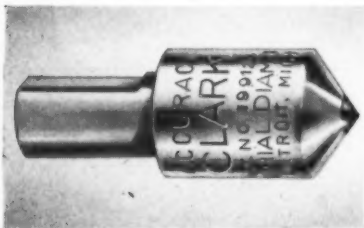
Charles F. Smith & Company

1723 E. Main

Owosso, Michigan

DIAMOND PENETRATORS

Two improved diamond penetrators for "Rockwell" testing are announced by Clark Instrument, Inc. The Clark "C" Diamond Penetrator fits all makes of hardness testers for standard "Rockwell" testing, and the Clark "S" Diamond Penetrator fits all machines for



superficial "Rockwell" testing. Both are carefully designed to provide accurate results. Diamond points are specially selected for proper stratification and freedom from internal stresses. Holders are expertly designed and fin-

ished to precisely correct angles and radii. The penetrators are accurately made to proper size and shape, and are exactly formed by expert lappers.

Clark Diamond Penetrator is furnished as a standard accessory on all Clark Hardness Testers, both for standard and for superficial "Rockwell" testing. Further information may be obtained from:

Clark Instrument, Inc.

10200 Ford Road, Dept. BB.

Dearborn, Mich.

FRACTIONAL HORSEPOWER DISC BRAKE

A new Stearns Magnetic Disc Brake for fractional horsepower application is announced by the Stearns Magnetic Manufacturing Co. This Series X-60 brake is suitable for 1/6, 1/4, 1/3, 1/2 and 3/4 h.p. motor use.

The housing is a cover for the mechanism only, and can be removed without disturbing the operating parts. Other features include straight-line solenoid pull for maximum mechani-



ATLANTIC for GEARS

Our service on small gears, due to new equipment recently installed, will interest you.

Send samples or blueprints for quotation.

ATLANTIC GEAR WORKS, INC.

198 Lafayette St., N. Y. 12, N. Y. Canal 6-1441



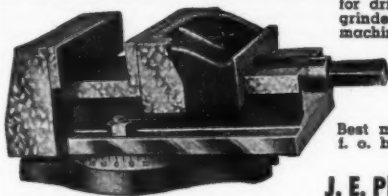
LATHE CENTERS and DRILL PADS

Description	No. 2 Taper	No. 3 Taper
L—SCREW CENTER.....	\$3.00	\$3.25
G—DRILL PAD.....	2.50	2.75
H—CROTCH CENTER.....	2.50	3.25
J—HOLLOW CENTER, 60°.....	2.00	2.75
I—60° CENTER.....	2.25	3.00
P—CARBIDE TIPPED CENTER.....	4.50	8.00
Q—HALF CENTER.....	2.25	3.00
N—CUP CENTER.....	2.00	2.75
M—SPUR CENTER.....	3.00	3.25

SOUTH BEND LATHE WORKS

428A E. Madison St.
South Bend 22, Ind.

PLUNKET IMPROVED VISES



We make a complete line of modern vises for drill presses, shapers, milling machines and grinders. Illustration shows our standard milling machine vise as regularly furnished and stocked.

In ordering this vise give size of slot in table:

No. 10—8" jaws, 1 1/2" deep, opens 5", wt. 45 lbs.\$55.00

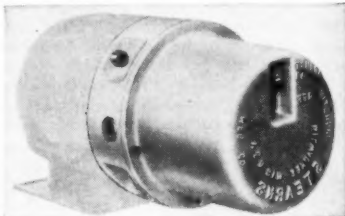
No. 20—10" jaws, 2 1/4" deep, opens 8 1/2", wt. 120 lbs.\$75.00

Best material and workmanship. Prices are net f. o. b. Chicago. Dealers' inquiries are solicited.

Write for folder TODAY.

J. E. Plunket Machine Co., 1825 W. LAKE ST.
CHICAGO 12, ILL.

cal efficiency; lining wear indicator and ease of adjustment to compensate for lining wear; brake easily disassembled for inspection; linings free from rivets to provide maximum wear.



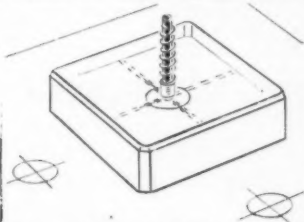
The new brake is offered for continuous intermittent duty; for a.c. or d.c. It is adaptable for motor or floor mounting and for horizontal or vertical operation, as specified. Bulletin 605-6X contains complete data and specifications.

Stearns Magnetic Mfg. Co., Dept. BB
Milwaukee 4, Wis.

ACCURATE CENTER PUNCH

Revolutionary design and application developments have been included in the manufacture of Vis-u-line Center Punch, a product of Unico, Huntington, New York.

A transparent plastic block, 2"x2"x1 1/2", supports the 1" steel punch at absolute right angles to the work. The block is clearly marked with broken, double cross-lines for easy alignment. A tap

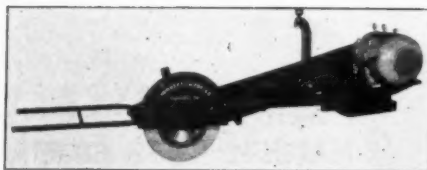


on the punch marks the true center of the cross-lines, the punch returning to its original position in the hand tool.

Write:

Unico, Dept. BB.
Huntington, N. Y.

MUMMERT-DIXON SWING FRAME GRINDERS



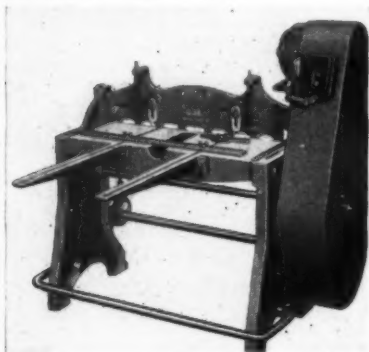
- Standard sizes for 24", 20", 16", 14" and 12" wheels.
- For high speed wheels at 9,000 to 10,000 sfpm. or vitrified wheels at 5600 to 6000 sfpm.
- V-Belt Driven — Two speeds.
- Convenient speed change.
- No balancing weights required.

Write for Bulletin No. 3

MUMMERT-DIXON CO., 122 Philadelphia St., Hanover, Pa.

LIGHTWEIGHT POWER SQUARING SHEARS

Famco Machine Co. has introduced a line of power squaring shears to satisfy the demand for lightweight, low-cost power machinery.



Famco power squaring shears feature economy of operation after installation. They are capable of cutting 18

gauge stock easily and rapidly. Three models are available in 36", 42", and 52" sizes.

Designed to save equipment and upkeep investment for departments and shops doing light work, these units are sturdily built throughout and equipped with powerful gear drives. Inlaid, precision-ground high carbon tool steel blades are furnished as standard equipment, as are adjustable front and back gauges, hold-downs and guards. The shears have special single stroke mechanisms which can be easily set for continuous operation. For additional details, write:

**Famco Machine Co., Dept. BB
Racine, Wis.**

"SCOTCH-WELD" BONDING FILM

An unsupported film of pure adhesive that provides a metal-to-metal bond resistant to shear tests up to 3,500 pounds p.s.i. is announced. Called "Scotch-Weld" Bonding Film, it is transparent, roughly resembles cello-



COMPLETE RANGE AS FOLLOWS:—

6" x 18"	12" x 36"	12" x 60"
6" x 36"	12" x 48"	12" x 72"

A precision tool for testing and checking parts between centers. Both heads adjustable, locked in place by lever-operated clamps. Work is held between one fixed center while spring loaded retractable center clamps work in position. Dial indicator with adjustable holder available as extra equipment.

FREE ADDITIONAL DATA covering complete specifications and additional features is contained in this bulletin. Write for your copy today. Ask for data sheet No. 476.



SUNDSTRAND MACHINE TOOL COMPANY

2535 Eleventh St. • Rockford, Illinois, U.S.A.

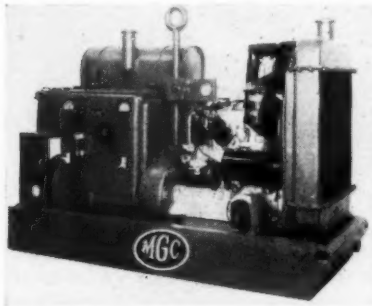
phane in appearance, and is provided in rolls like tape. It is 100% adhesive, with no supporting material in the film.

The film is placed between units to be bonded and is cured by simultaneous application of heat and pressure — a heat of 300 to 500°F for from 5 to 60 min. and a pressure of 25 to 100 lbs. p.s.i., both varying with the type of bond desired. The advantages embrace high bonding strength to a variety of materials, ease of application, simplicity of production line use, long life on the roll, assurance of adhesion over the entire surface, and inertness in water, oils and most solvents. Preparation of surfaces requires only conventional cleaning. For complete details, write:

Minnesota Mining & Mfg. Co.
900 Fauquier Ave., Dept. BB
St. Paul, Minn.

M.G.C. MAGNET GENERATORS

A new line of Gasoline Engine Driven Generators to supply power for handling scrap or pig iron with magnet cranes is announced by Motor Generator Corp. These units are available in six sizes, ranging from 5 KW to 25 KW. They are compact, light in weight and are without canopies for easy installation in the crane operator's cab.



A commercial automotive type gasoline engine is standard, but it can be furnished with a Diesel engine at extra cost. The generator is connected

ARGUTO OILLESS BEARINGS

USED

ALL OVER THE WORLD

... IN MANY DIFFERENT
APPLICATIONS

"OUTWEARS THE BEST
BRONZE METAL"

20 years



ARGUTO OILLESS BEARING CO.

WAYNE, ILLINOIS

PHILADELPHIA

directly to and on a common structural steel base, and is drip proof, ball-bearing mounted, self ventilated and rated for continuous duty.

All models are furnished complete with 6-volt battery ignition, push button starter, radiator, and fuel tank; they are assembled and ready for service. For details, write:

**Motor Generator Corp., Dept. BB
Troy, Ohio**

GROUND CARBIDE DIE-MACHINE FILES

It is now possible with Severance Ground Carbide Die-Machine Files to make alterations or corrections on hardened dies, (as hard as Rockwell 63 C) without the risks involved in annealing and rehardening.

These ground Carbide files are claimed to finish faster than the un-ground type, and to outlast scores of carbon files on the usual run of operations. They can be used in die-making, finishing parts, templates, and most materials where a relatively straight surface is to be worked. When

used on production parts it is possible to increase output from double to 10 times the previous experience.

Severance is offering several sizes of these files in four standard shapes; round, square, rectangular, and triangular. They have been produced



chiefly for use on die-filing machines, but can be used manually or in any reciprocating device or manner.

For further information, write:

**Severance Tool Industries Inc.
722 Iowa St., Dept. BB
Saginaw, Mich.**

WILLEY'S

• Standard tools carried in stock for immediate delivery. Special tools built to your specifications.

Catalog gives full information on standard tools and blanks, as well as special tools, gages, centers, centerless grinder rests, diamond tools and other special articles.



GENERAL PURPOSE TUNGSTEN CARBIDE TOOLS



NOW!
By the Box

Get Willey's Standard
Tools by the box.
Handy

Write for
CATALOG 30

WILLEY'S CARBIDE TOOL CO.

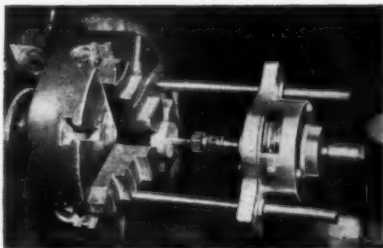
SOLE MAKERS OF WILLEY'S METAL

1342 W. Vernor Highway

Detroit 1, Michigan

HERE'S HOW:

TO TAP . . . and back out . . . WITHOUT STOPPING THE WORK OR REVERSING THE MACHINE



**The
ERRINGTON
AUTO-REVERSE
TURRET LATHE
TAPPING HEAD**

can also be used on drill press work for production-tapping. For this the Errington Head has a 2 to 1 reverse, and uses guide-bars to hold and steady the case.

The Errington Auto-Reverse Turret Lathe Tapping Head is a new tool, practical, time-saving, money-saving. In a turret lathe setup, as illustrated, it allows you to tap the hole and back out the tap without stopping the work or reversing the machine. It's easy to operate: you simply feed the tap into, and out of, the drilled hole while the work is turning in the one direction.

The new Tapping Head is a money-saver in this respect, too: with the aid of a friction chuck, you can tap blind holes without any possibility of tap breakage.

Send For Complete Information

Established 1891

ERRINGTON Mechanical Laboratory, Inc.

Main Office and Plant: STATEN ISLAND 4, N. Y.

Chicago Office:
6701 N. Sioux Avenue

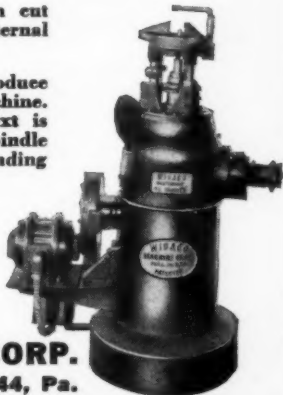
New York Office:
170 Broadway

OIL GROOVING made easy by WICACO

The WICACO Continuous Oil Groover can cut grooves of all descriptions INTERNAL or external — CONTINUOUS or intermittent.

Operators need no special training to produce oil grooves with this highly flexible machine. Change from one grooving job to the next is readily done without delay. Its upright spindle and chuck permit rapid loading and unloading of work without stopping the machine.

It will pay you to investigate the remarkable, low cost results the WICACO Continuous Oil Groover offers. Write today—outline your oil grooving problem and complete information will be sent without obligation.



THE WICACO MACHINE CORP.

Wayne Junction,

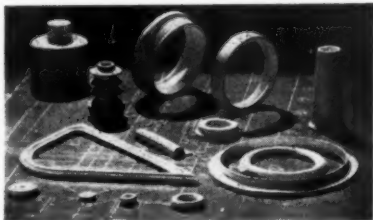
Philadelphia 44, Pa.

SILICONE RUBBER PRODUCTS

It was announced recently by the Stalwart Rubber Co. that gaskets, diaphragms, grommets, washers, seals and packings, and numerous other extruded and molded shapes and products are now available made from Silicone Rubber. This new material has been developed specifically to meet the demands of many high and low temperature applications in which resiliency is of primary importance. Silicone rubber looks and in many ways acts like conventional rubber, and it retains rubber-like qualities and elasticity at extreme temperatures (from 150° to 500°F).

Silicone rubber parts are resistant to permanent compression even under extreme heat, and withstand the effects of prolonged weathering. They have excellent water repellency, which enables them to maintain high surface resistivity under moisture condensing conditions. Silicone rubber parts also resist lubricating oils and some chemicals.

Products shown in the illustration portray only a small number of the shapes that can be furnished. Tubing is available in sizes having from 1/16"



to 4" I.D., and from 1/8" to 5" O.D., and from 1/16" to 4" wall thickness.

Additional information is available upon request.

The Stalwart Rubber Co., Dept. BB
156 Northfield Road
Bedford, Ohio

New! It's the GOVERNOR CONTROL Speed-Right Flexible Shaft

CHECK THESE IMPORTANT EXCLUSIVE FEATURES

- ✓ Variable Governor Control Motor delivers constant desired speed under heavy load or while idling.
- ✓ Sturdy Heavy Duty Ball-Bearing Motor powers the flexible shaft at any speed required from 1000 rpm to 10,000 rpm.
- ✓ Instant-set Smooth Efficient Power for stock removal and polishing of all materials hard or soft.
- ✓ Handpieces For All Types of Work—Ball-Bearing Chuck—Small Pencil Collet—Reciprocal Filing—Hammer Peening.



DO IT RIGHT WITH

Speed-Right

THE ELECTRO-MECHANO CO.
261 East Erie Street
Milwaukee 2, Wisconsin



Variable Speed Motors



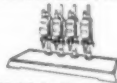
Flexible Shaft Units



Air-Feed Drill Heads



Sensitive Drill Presses



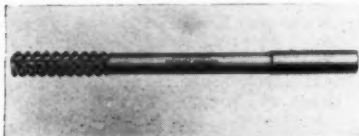
Multiple Head Drills

BLIND HOLE ROTARY BROACHES

Rotary Broaching is a new technique developed by Shearcut Tool Co. for producing perfectly finished holes to exact size.

The Rotary Broaching process is a true broaching operation. The Rotary Broach produces a true Shearcutting action by virtue of end pressure and rotation of the tool or work as it is fed into the work. This shearcutting action gives amazingly long tool life.

Designed to be used to replace reamers and to eliminate a second broaching operation, Rotary Broaches may be used in lathes, turret lathes, automatics, boring mills, milling machines, jig borers etc., for the production of perfect holes which may be held to limits of one tenth of one thousand inch.



The new Shearcutter Blind Hole Rotary Broach embraces features not found in the standard Rotary Broach. The helical cutting flutes are right handed, this causes the chips being removed to be fed out of the blind hole and makes it possible to feed the Rotary Broach to the bottom of the blind hole.

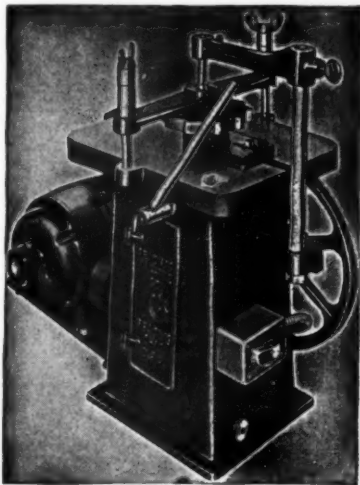
Blind Hole Rotary Broaches are sharpened on the front end and also on the helical cutting flutes. The front end cutting edge removes most of the metal, leaving from .006 to .010 to be removed by the short sharpened taper section on the front cutting edge of the helical land. The helical lands are ground with a back taper of .0003" per inch to prevent drag and scaring of the work due to misalignment of spindle and holder.

Stock sizes start at 3/16" and are increased by 1/32" to 1". From 1" to 1 1/2" stock sizes are by 1/16" increments. Write:

Shearcut Tool Co., Dept. BB.
Box 746, Reseda, Calif.

NO BUSHINGS, GUIDES or PILOTS NEEDED

THE READING BROACH KEYSEATER

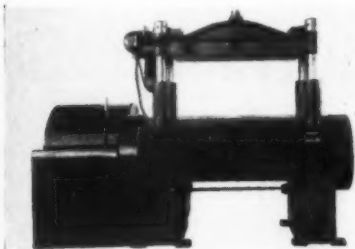


The Reading Bench Machine requires no bushings, guides or pilots. No other machine like it. Very fast—capacity from 1/4 to 3/4 cutter. Prompt delivery—low first cost.

READING MACHINE CO.
READING (CINCINNATI) OHIO

100-TON DIE TRYOUT PRESS

A new 100-ton production type die tryout press is being manufactured by Alpha Tool Works. The new press operates at 60 strokes per minute to give a true picture of actual production conditions. The head lifts out of position



by electric control and inverts so that both members of the die are readily accessible for finishing work without removing the die from the press.

After finishing, the head returns electrically to its original position for an-

other production tryout. Positive relocation of the head is assured by hardened and ground locating pins.

The new press is provided with a 6" stroke, and operates at 60 strokes per minute. The maximum shut height is 16", the minimum shut height, 12". The clearance between the columns, left to right, is 44". The bolster plate dimensions right to left, are 65", and from front to back, 26". The distance from the floor to the top of the bolster is 40." The unit is provided with an electric elevating head and a friction type clutch equipped with an inching control. Two forged steel, synchronized crankshafts are standard equipment; crankshaft bearings are bronze. The machine is actuated by means of a 10 h.p. motor, V-belt drive. For complete technical information on this new press, write the manufacturer:

Alpha Tool Works, Dept. BB
9281 Freeland Ave.
Detroit 28, Mich.



The New High Speed Hydraulic Press

All Castings Meehanite Metal

For

Fast Assembly and
Broaching

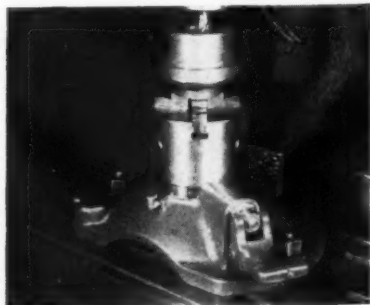
Write For Bulletin 112G

GREENERD ARBOR PRESS CO.
Nashua, N. H.

G & H COLLET FIXTURE PROVIDES FAST FINISHING

The G & H Indexing Collet Fixture is designed to speed the machining of pieces requiring several similar operations on one machine. It is quick acting for easy set-up and fast indexing. The device can be mounted at any angle on a variety of machines, such as millers, grinders, shapers, and drill presses (key bolts for table slots are made to user's specifications). The sturdy construction of the unit insures vibrationless operation under exacting conditions, resulting in accurate, fast finishing whether straddle or plain milling, slotting, grinding, drilling, or tapping.

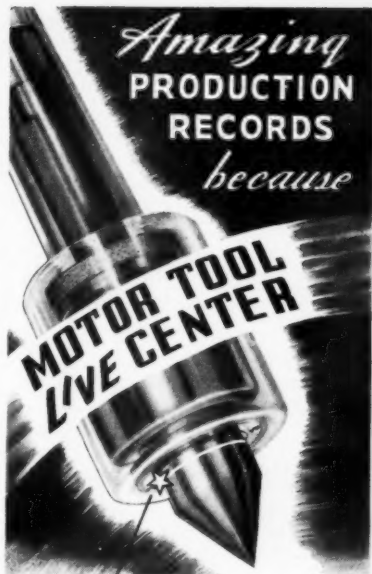
Interchangeable index plates, having 2, 3, 4, 6, 8, 12, or 24 stops are standard equipment, to make possible the finishing of a wide variety of parts having many faces, splines, flutes, slots, etc. Special plates can also be furnished for especially complex operations. The G & H Indexing Fixture is equipped with



the No. 22 Brown & Sharpe standard stationary collet. The chip clearance is through the index fixture, and needs no air or oil to keep it clean.

For complete specifications on this interesting device, write the manufacturers for illustrated folder.

G & H Mfg. Co., Dept. BB
327 Elm St.
Fitchburg, Mass.



is the **ONLY** Center
with the
**OVERLOAD
INDICATOR**

Look for the **RED BAND**

You no longer have to guess whether you are overloading your live center thrust bearings if you use **MOTOR TOOL LIVE CENTERS**. When the load is too great the **RED BAND** around the spindle disappears into the housing. You can see at a glance when overloading occurs. This is an exclusive feature, developed by Motor Tool which cuts repair costs to practically nothing if due diligence is exercised. As long as the **RED BAND** is visible you are running **COOL** and **SAFE**.

Send for

NEW descriptive folder . . . and verified case histories of how **MOTOR TOOL LIVE CENTERS** have out-performed and outlasted ALL other centers on exceedingly tough, continuous-run jobs.

MOTOR TOOL MFG. CO.
8663 DAYTON ST. DETROIT 10, MICH. PHONE DR-0349

Make It a Rule
to Call Motor Tool

LUCIFER...

ELECTRIC HEAT-TREATING FURNACE

MODEL—DL 7052

Set the dial . . . throw the switch, that's all! The furnace climbs to predetermined temperature. Climbs to 1600° F in 40 minutes . . . 2000° F in 72 minutes. Contains over 1725 cubic inches of muffle. Complete with Lucifer 100% automatic electronic control. Muffle size is 12" wide, 12" high, 12" deep.



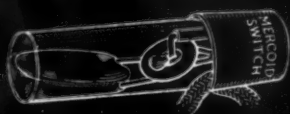
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GILBERT S. SIMONSKI

401 N. Broad St., Philadelphia 8, Penna.

MERCOID

MERCURY SWITCHES



Universally Known for Their Superior Quality and Workmanship

They are not affected by dust, dirt or corrosion and have many definite applications where open contacts are not suitable. Various types available. MERCOID is your guarantee of the best in mercury switches. Further information sent upon request.

An able staff of engineers is at your service.

THE MERCOID CORPORATION
4203 BELMONT AVENUE • CHICAGO, ILLINOIS

IT PAYS TO GET THE BEST

MONTGOMERY HAND SPRING WINDER

NO
LATHE
NECESSARY



1. Ideal for tool room & Maintenance shop
2. Easily operated by hand
3. No lathe necessary
4. Mandrel capacity to 1 1/2"
5. Wire capacity up to 225 in. Diameter
6. Pitch capacity up to 1"
7. Clamps in your bench vise

4 SIZES

PRICED from \$15 to \$35

Delivery one week

Write for descriptive literature

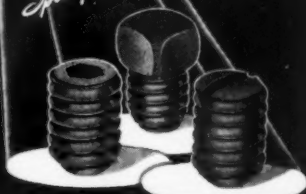
MONTGOMERY & CO. INC.

53 Park Place

New York City

MOORE SET SCREWS

Spotlight Progressive Industry



GEORGE W. MOORE, Inc.
100 BEAVER ST. WALTHAM, MASS.

POR-MATIC

AIR-OPERATED

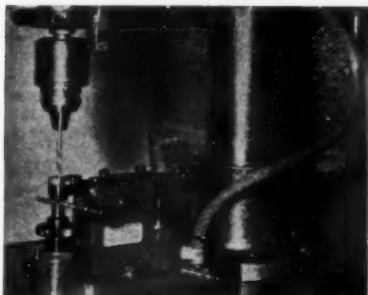
DRILLING FIXTURE

• This POR-MATIC air-operated Universal drilling fixture is rigid, sturdy and machined to exact tolerances. It will handle round stock 1/16" to 1" and by using a special upper beam or drill bushing carrier 1 1/2" can be received for cross drilling. This fixture can be mounted on any of the regular bench type or floor type drill presses in a matter of minutes. Depending on type of material and diameter of hole size, it will increase production from 33% to 200%.

Price \$75.00 Air Regulator and Gage Extra \$8.35

Send for literature giving complete description.

Distributors' inquiries invited.



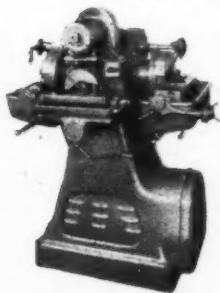
Patent Pending

THE PORTER MACHINE CO.

3100 ENYART AVE

CINCINNATI 9, OHIO

HOW TO GRIND CARBIDE CUTTING TOOL BITS ECONOMICALLY



Here's tool grinding at its best!

Employing 3-step progression—rough, semi-finish, and finish or hone—on one machine, this LeMaire 3-Wheel Grinder produces keener edge in fraction of time. Because tools go to diamond wheels in better condition, life of diamond wheels is considerably lengthened. Both labor and wheel costs are reduced—time is saved—production is increased.

Wouldn't you like to know more about this remarkable 3-Wheel Grinder? Send for descriptive folder.

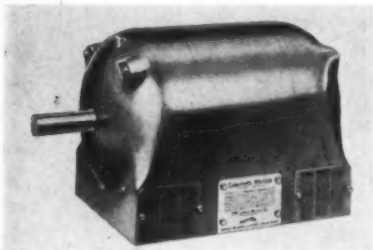
LeMaire Tool & Mfg. Co.

2657 S. Telegraph Road
Dearborn, Michigan

Designers and builders of unit and way type machines for single or multiple spindle drilling, boring, reaming, tapping, etc.—Twin Ram Hydraulic Units—Match-It Gear Chucks.

NEW SANITARY LOUIS ALLIS MOTOR

The Louis Allis Co. is now in production on a sanitary motor for use in dairies, food process, canning and beverage plants. The motor is streamlined and free of cracks or recesses



where milk or food products can collect. Smaller ratings will be supplied in the totally enclosed, non-ventilated construction which prevent the entrance of vermin into the motor. Larger ratings are splash-proof and will be

supplied with removable stainless steel grille plates over the cooling air inlets and outlets, also making it vermin-proof.

The entire base is enclosed by the motor housing which is finished to a flat surface, preventing the collection of milk or food particles under the motor. Mounting bolt holes are located in accordance with NEMA standards permitting this motor to be completely interchangeable with motors now in use.

The base design also permits the use of a built-in conduit box, eliminating the usual projecting box supplied on motors of conventional design. Conduit may be brought into the motor through the side or bottom of the motor housing, permitting the most advantageous power connection for the particular installation.

The motor will be supplied with the Type C flange for pump applications and with all of the standard and special voltages, frequencies and electrical

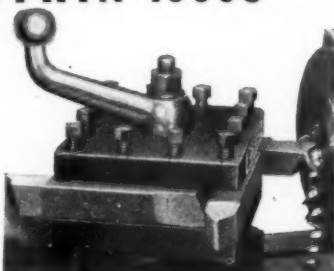
ACCURATE WITHIN .0005

Enco LATHE TURRETS

Enco Lathe Turrets re-index to the same position within five ten thousandths. Piece after piece can be machined with complete confidence in production precision.

There are no pins or bushings in Enco Toolpost Turrets to wear "egg shaped" or out of alignment. This ability to "come back" accurately makes Enco users come back for more turrets.

Also Mfrs. of Enco Hex turret Bed Turret for 9" to 16" Lathes.



- 12 POSITION INDEXING
- 3 WORKING POSITIONS FOR EACH TOOL
- HARDENED STEEL CONSTRUCTION
- MOUNTS RIGIDLY IN COMPOUND T-SLOT
- KEEPS SETTING ACCURATELY
- INDEXING IS SELF-CONTAINED. ELIMINATES ALL CHIP INTERFERENCE

ENCO MANUFACTURING COMPANY

Dept. 29 — 4522-24 W. Fullerton Ave., Chicago 39, Illinois

modifications that may be encountered. For vertical shaft or flange mounted applications, a round frame, non-ventilated motor of streamlined design will be supplied with a conduit box built into the end bracket of the motor.

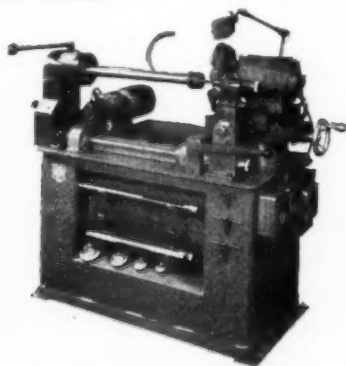
For further information, write for Bulletin No. 711 to:

The Louis Allis Co., Dept. BB
Milwaukee 7, Wis.

HYBCO TAPPER TAP GRINDER

A grinder which accurately sharpens chamfers of 90° bent, and 180° precision hook taper taps, is announced by Henry P. Boggis & Co. The new unit is designated as the Model 1500 Hybco Tapper Tap Grinder.

In the past, most users of taper taps have hand-sharpened the flute and chamfer. Hand-sharpening the chamfer can develop trouble, although hand flute-sharpening can be done satisfactorily. According to the manufacturer, the Model 1500 Hybco Tapper Tap Grinder accurately grinds the chamfer, increases tap life and the quality of the threads.



The machine is designed for 90° bent or 180° precision hook taps 3/16" to 1 1/4", and straight shank taper taps 3/16" to 2 1/2". The length of chamfer and amount of relief is variable. Complete information may be obtained upon request to:

Henry P. Boggis & Co., Dept. BB
1279 W. Third St.
Cleveland 13, Ohio.

get **STAR** satisfaction from this **complete line**

IN THE complete STAR line, there's a STAR blade for every kind of job and whatever the job, you'll find your hack saw or band saw doing it better with a STAR blade.

Tell your supplier what you want. Let him select your blade or frame from the complete STAR performance-proved line. You'll have a faster, cleaner cutting, longer lasting blade; you'll have the right blade, a STAR BLADE!

HAND
BLADES

POWER
BLADES

FRAMES

BAND SAWS
(Metal cutting,
including Skip-tooth)



Sold only through
recognized distributors



REX MULTI-WELDER ATTAINS 7000 WELDS PER MINUTE

The latest model of the Rex Multi-Welding Machines provides an overall welding width of 112". The machine is equipped with two slitters and two trimmers, and while various widths of finished fabric can be secured, it is set for three finished rolls 36" wide. The Welder has a range of from 18 gauge W.&M. to 12 gauge W. & M.

The Welding Heads or Transformers are so arranged that spacings of 1" x 1" and larger can be increased by increments of 1/2", and the transverse wire can be increased by increments of 1".

The Welder is equipped with fifty-six, 10 KVA, 440 Volt, water cooled Transformers. Each has its own individual heat control switch with three tap settings, permitting separate heat settings on individual Transformers as required. The heat is further controlled by three Westinghouse Synchronous Panels which include phase shift heat control. The Welder is operated by means of a 15 h.p. motor and actual welding speed is better than sixty welds per minute so that the average production of finished mat is approximately forty-five sq. feet. per minute on 1" x 1" mesh with corresponding increase in



production on the larger meshes. Approximate speed is 7,000 welds per minute.

The transverse wire is fed through a wire straightener feed mechanism into a rotary magazine which is totally enclosed. The wire is cut to length before leaving the machine and when ejected, has only a 1" overhang on each side which can be removed by the trimmer after the weld has taken place. Standard No. 1 Morse Taper Tips are used in the upper electrodes, all of which are individually spring loaded. The lower welding Tips are specially designed for this machine which are mounted directly on a solid secondary. The movable welding head can be

**SOUTH
BEND**

Universal Tool Block

Replaces tool post and nine standard tool holders. Rigidly supports turning, boring, threading, and cut-off tool bits. Rotatable. Has self-aligning knurling head. Precision adjustment for tool height. No re-adjustment required when replacing tools. Adaptable to some other lathes. Write for dimension sheet.

Lathe Size	9"	10"	13"	14 1/2"	16"	18 1/2"
Price	\$11.25	13.75	13.75	15.75	16.25	

426A E. Madison St. South Bend 22, Ind.

SOUTH BEND LATHE WORKS

*For
Fast, Accurate
Metal-Cutting
Use*

KENNAMETAL

CEMENTED CARBIDE
TOOLS, BLANKS, and MILLING CUTTERS

KENNAMETAL Inc.

LATHROP, WA.

swung out of place for removing and cleaning Tips.

The overall dimensions of the machine are 19' x 15'. Floor space required is 15' x 20' including spacing between the machine and the baler. The machine is controlled entirely from one central panel by a series of push buttons mounted where the operator has full view of the welding operations. For complete specifications, write:

Rex Welder & Engineering Co.
1910 Walnut St., Dept. BB
Kansas City 8, Mo.

PLASTIC FASTENERS HAVE MANIFOLD USES

Plastic spring-lock shelf-supports, complementing metallic supports of the same type, which lock and unlock with a quarter turn, have been developed by the Simmons Fastener Corp. These new fasteners, made of polystyrene, ethyl cellulose, or butyrate, can be produced at greatly reduced cost, and can be used wherever load requirements permit. They are produced with steel inserts to provide for maximum strength.

The new devices can be provided with many varieties of heads, for use as refrigerator shelf-supports, dashboard plugs, ornamental knobs, and many similar applications. The spring wire, which is twisted at installation, provides high torsional strength to withstand vibration, and at the same time enables speedy installation.



Accessibility to the back of the sheet in which these fasteners are mounted is not necessary. The fasteners can be installed from one side of the panel so that both original installations and replacements can be made in "blind" fashion. For details, write:

Simmons Fastener Corp., Dept. BB
1760 N. Broadway
Albany 1, N. Y.

ROGERS REAMERS ... 1885 - 1948



Fig. 37



Fig. 39



Fig. 26-S



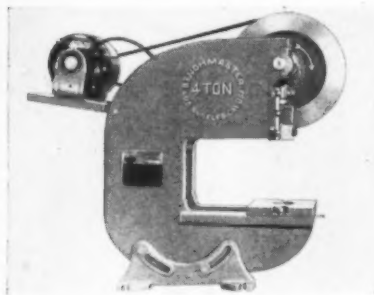
Rogers Solid Adjustable for Wear Reamers and Patent Adjustable Hollow Milling Tools have been basic tools throughout the world for the past 62 years. Write for catalog.

**THE JOHN M. ROGERS
TOOL CORPORATION**

GLOUCESTER CITY, NEW JERSEY

BENCHMASTER DEEP THROAT PUNCH PRESS

Benchmaster Manufacturing Co. announces a new deep-throat punch press. Still of 4-ton capacity, the throat depth has been increased to punch to the cen-



ter of a 17½" circle, making this press of exceptional value on sheet metal work as well as on all jobs requiring deep horizontal space. Adequate power is furnished on most jobs with a 1/3 h.p.

motor. Frame size and weight have been considerably increased and webs added between frame sides for extra reinforcement. The press may be used either with or without the 6" x 8" x 1" bolster plate.

The unit is supplied with either 1" or 1¼" stroke, (strokes up to 2" on special order). The ram position is adjustable and dovetails are gibbed for takeup if wear occurs. All bearings are bronze bushed. A positive, single trip, safety mechanism is employed to engage the flywheel.

The new press may be supplied either as a bench or pedestal model with inclinable frame positioning. Cast iron legs are available as a standard extra. A new circular is available describing all features with complete specifications.

Benchmaster Mfg. Co., Dept. BB
W. Pico & Hobart Sts.
Los Angeles 6, Calif.

BUFFALO PNEUMATIC CHIP GUN

A NEW METHOD OF REMOVING CHIPS FROM BLIND DRILLED AND TAPPED HOLES.

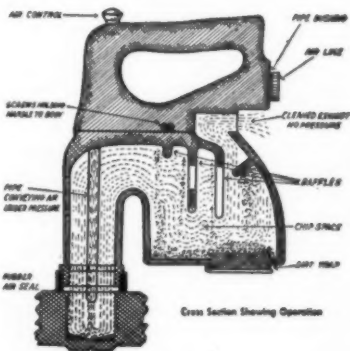
SAFE! CLEAN! EFFICIENT!

Eliminate the danger to your workmen from flying chips by removing your cuttings with the BUFFALO PNEUMATIC CHIP GUN. Simply place the nozzle over the hole, release the air by thumb pressure and the cuttings are deposited in the body of the gun.

Available in two sizes:

Model A—For ¼" to ⅝" dia. holes

Model B—For ½" to 1½" dia. holes



Write for Bulletin No. 1011 today

BUFFALO MACHINERY CO., INC.
838 Grant Street
Buffalo 13, New York

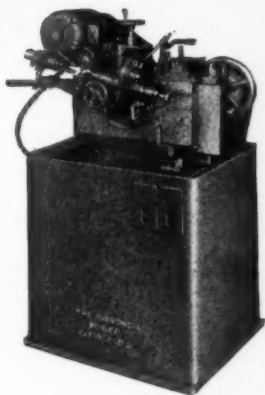
AUTOMATICALLY FLUTES

- TAPS
- REAMERS
- MILLING CUTTERS

Sharpens metal cutting saws
in gangs

Wardwell Automatic Flute Grinder 50F is completely automatic. Set the reamer or tap in the machine and forget it. Within a few minutes an accurately ground flute is finished.

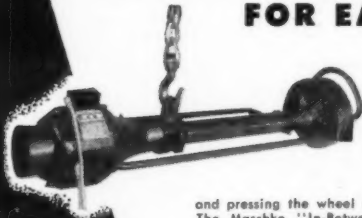
It indexes automatically and thus can be operated with unskilled labor.



WRITE FOR BULLETIN 50F

THE **WARDWELL** MANUFACTURING CO.
3165 Fulton Road, Cleveland 9, Ohio

THE "IN-BETWEEN" FOR EASE IN HANDLING



The Marschke "In-Between" Grinder is designed to give most efficient performance with minimum effort . . . and at minimum cost.

This direct-drive swing frame grinder is easily maneuvered, permitting it to get to the work in the most efficient manner. The combination of balance and swivel suspension results in less fatigue on the part of the operator . . . his effort goes into guiding

and pressing the wheel against the surplus metal areas.

The Marschke "In-Between" Grinder is far more powerful . . . more productive . . . than portable hand tools.

Write today for further details. Other machines in the complete Marschke Line include pedestal and floor stand grinders and buffers and the Heavy Duty Swing Frame grinder and Buffer.

Write today
for complete
details

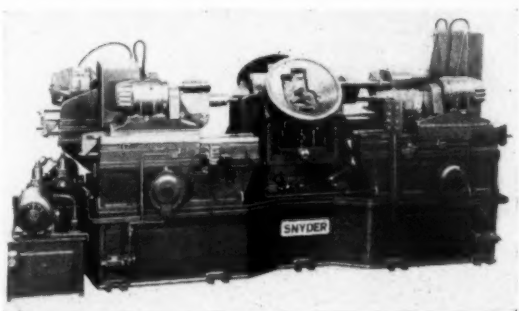
**VONNEGUT MOULDER
CORPORATION**

1805 MADISON AVENUE, INDIANAPOLIS, INDIANA

SIMULTANEOUS DRILLING AND BORING OF CROSS SHAFT HOLES

A machine which drills and line bores cross shaft holes in 70 different sizes and types of clutch housings is being built by Snyder Tool & Engineering Co. A work piece is clamped in each of two stations on a manually rotated index table mounted centrally between the slides. The stations permit drilling and boring operations to be performed simultaneously. Fixtures are provided with vertical slide-in-and-out adjustment. Locating holes also are provided for all part locating pins needed for the complete range of work pieces.

Four hydraulically actuated slide units are mounted horizontally and opposed in pairs, front and rear. Slides



move on hardened and ground ways, one flat, the other V-type. The two rear slides are equipped with single spindle drill heads and are used to drill the cross shaft holes. The two front slides are equipped with Parker boring spindles for finish line boring

CUT ANY SHAPE BETTER with BEVERLY Throatless SHEARS



The No. B-3 BEVERLY Bench Type Shear with Ball Bearing Hold Down handles 3/16" or No. 10 gauge stainless steel. This sturdy shear weighs 58 lbs. and is equipped with H. C. H. Blades for heavy duty service.

Let us send Bulletins giving full details on the BEVERLY LINE—

THE BEVERLY SHEAR MFG. CO., 3005 W 110th Pl., Chicago 43, Ill.

the holes. These front spindles are provided with micrometer adjustment permitting precision setting of the finish boring tools, which are tungsten carbide.

Drilling and boring spindles are driven by a Reliance "V-S" Drive which permits spindle r.p.m. to be altered to suit the size of the tools being used. Slides are lubricated from a pump and tank unit mounted at one end of the machine. Slide feed rates are controlled by individual feed control valves. Estimated production is 65 pieces per hour at 80% efficiency. Floor space required is 175" x 75". For complete specifications, write:

Snyder Tool & Engineering Co.
E. Lafayette St., Dept. BB
Detroit, Mich.

CARBIDE END MILLS WITH REPLACEABLE BLADES

The W. T. Howald Machine Works adds another Carbide End Mill with Re-Milling Cutters.

These End Mills, especially designed for production milling, are 1½", 2" and 3" diameter and have, as an integral part, No. 40 NMTB, Weldon or Brown and Sharpe No. 9 shanks. The replaceable carbide tipped blades are made of standard square stock without



serrations, grooves or other limiting elements. The unique "Cone Blade Lock" permits rapid adjustment to within a few thousandths, minimizing cutter grinding and reducing set-up time. These cutters are used extensively on manufacturing type milling machines.

For complete specifications and information, write:

W. T. Howald Machine Works,
182 Sigourney St., Dept. BB.
Brooklyn 31, N. Y.

FREE

Engineering Data on **CERRO ALLOYS**

Available Now!

Check the
Pieces you De-
sire and Clip
ad to Your Let-
terhead



- ☐ Informative 8-page booklet describing mold-making with Cerro low-temperature melting alloys.
- ☐ Single sheet on the correct casting procedure of Cerro Alloys.
- ☐ Helpful 4-page folder on the application of Cerromatrix in making chuck jaws easily and economically.
- ☐ Single sheet giving physical properties and data of Cerro Alloys.



CERRO de PASCO
COPPER CORPORATION

Dept. 7

40 Wall Street, New York 5, N. Y.

CLOSED
TRADE

AUTOM

CLOSED
MARK

PLAIN Type

Offset Type

CONTINUOUS HINGES

All hinges shown can be furnished with special holes, cutouts and bends to blue-print in metals to suit the job.

THREE-FOURTHS OFFSET.

AUTO MOULDING & MFG. CO.

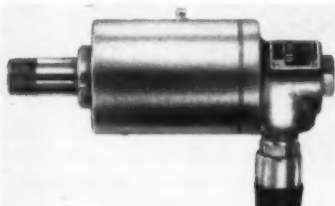
1110 E. 87TH ST.
CHICAGO 19, ILL.

SPECIFICATIONS:
Open Width $\frac{1}{8}$ " to 6"
Gate Material .040 to .125
Pin Diameter .101 to $\frac{1}{16}$ "
Lengths to 120"

SEMI-OFFSET

NEW ROTATING UNION HANDLES VAPOR, AIR, OR LIQUIDS

The new Deublin Union, a leak proof, 3-in-1 rotating joint, employed in heating or cooling revolving shafts, cylinders, or drums from -30° F. to 300° F., will handle steam, air, or liquids efficiently. Leakage is prevented through use of a special pressure seal and press fit assembly.



Starting torque is practically eliminated. Double row ball bearings and precision assembly of the Union reduce friction to the minimum. Lubrication is of the purge type and grease is held

where needed, by a system of pockets.

There are two types of Deublin Unions which are interchangeable, the Monoflow for introduction of the cooling or heating medium into one side of the cylinder or shaft; and the Duoflow for introducing and withdrawing the cooling or heating medium from the same side of the revolving cylinder or shaft. The Deublin Union is available in $\frac{1}{2}$ ", $\frac{3}{4}$ ", 1", and 1 $\frac{1}{2}$ " pipe sizes. Bulletin D-11 is available for further details.

Deublin Company, Dept. BB
Northbrook, Ill.

NEW TIP CLEANER DEVICE

A Tip Drill Kit is being manufactured by the J. M. Ragle Industries of Kansas City, Mo.

The kit is approximately the size of an automatic pencil, and is designed with pocket clip so that it can be carried in the pocket.

The end is a tempered steel double-end chuck holding drill sizes 45-80. The

END MILLS

Regular or Tapered
Spiral or Straight Flute
Get Our Prices on Specials

CADILLAC CUTTER CO.
1613 EASTERN SE
GRAND RAPIDS 7, MICH.

CAMS

Our ROWBOTTOM cam cutting facilities are at your disposal for your cam requirements.

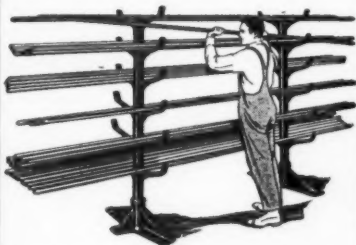
Let us have your inquiries.

BLOOMFIELD TOOL CORP.

36 Farrand St. Bloomfield, N. J.



Each BROWN SECTIONAL RACK combines five major and several minor features of design, all of which save money for its owner. The time previously lost in end-hauling each bar of stock its entire length from the old-style, closed-side Rack is saved by the Brown Rack which requires but a few inches of side movement.



Each length, width and thickness of stock is displayed in Gold-Fish visibility for instant selection and workmen waiting for stock are served without waste of time. The BROWN SECTIONAL RACK is a simple, durable article built in five styles from standard interlocking metal sections. It cannot burn, sag or twist; unattached to the building, it can be moved at will. Changes in length of stock can be met by moving the units nearer or farther apart, while increases of stock can be met by simply adding more standard units. Built from metal throughout, depreciation is practically nil. SEND FOR BULLETIN NO. 26-B.

BROWN SECTIONAL RACK

BROWN ENGINEERING CO.

126 N. THIRD ST. READING, PA.

PAKES • VISES • CLUTCHES • COUPLINGS

UNIVERSAL DRILL BUSHINGS

Universal Drill Bushings with superhoned bores have been the first choice of industry since the founder of Universal Engineering Co. originated standard drill bushings nearly 30 years ago. Available in standard and special sizes to speed and simplify your jig drilling at greatly reduced tool breakage costs. Complete stock of standard bushings available for immediate shipment. Write today for complete information.

UNIVERSAL ENGINEERING CO.
FRANKENMUTH 10, MICHIGAN

handle holds 24 different size drills. Twelve assorted drills in even number sizes 52-74 inclusive, are supplied with the kit.



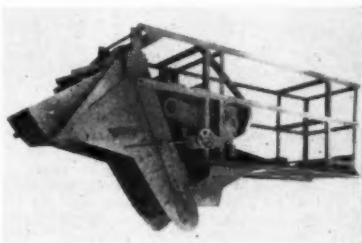
Since this tip-cleaning tool actually uses carbon steel drills, most every welding tip can be cleaned and reconditioned in a matter of a minute of two.

J. M. Ragle Industries, Dept. BB
Kansas City, Mo.

HOPPER-FED INSPECTION TABLE

The D. H. Prutton Machinery & Tool Co. of Cleveland announce the addition of an Inspection Table to their steadily growing line of products. An elevator-hopper feeds any small, mass-production item onto a 2 x 8 foot conveyor belt for visual inspection. A multi-speed transmission and a variable angle control allows any desired distribution on the table. Because it is designed

for small parts, such as nuts, bolts, washers, etc., it is possible to inspect as many as 130,000 pieces per hour. The Inspection Table requires only 48



square feet of floor space and is built so that all moving parts are readily accessible. For further information write:

D. H. Prutton Machinery & Tool Co.
5295 W. 130th St.
Dept. BB, Cleveland, Ohio.

YOUR "SPECIAL BUSHINGS" May Be Our Regular STOCK ITEMS!



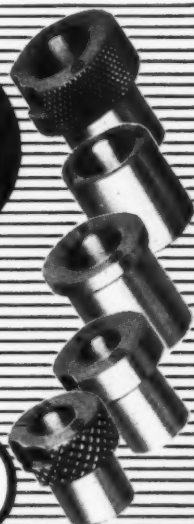
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TWO complete bushing standards, the A.S.A. Standard plus our own Acme Standard, enables you to obtain bushings from stock that might otherwise require special manufacture. Results in faster delivery, lower cost. Write for catalog.

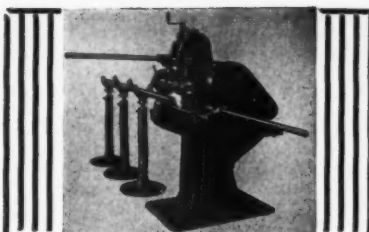
Accurate
Interchangeable
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Acme Industrial Company

Makers of Hardened and Ground Precision Parts
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THE SERVICE SHOP TO INDUSTRY FOR MORE THAN 25 YEARS



Faster TUBE & PIPE CUTTING

Steen High-Speed pipe, tube and column cut-off machines embody unique design and rigid construction features to greatly step up cut-off operations. Available in three sizes to cut diameters $\frac{1}{4}$ " to 3"; $\frac{1}{4}$ " to 6"; 3" to 12".

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Continental Machine Co.
1954 Maud Ave. Chicago 14, Ill.

DORMAN AUTOMATIC REVERSE

TAPPERS tap holes 2-56 to 2"

FRICTION OR POSITIVE DRIVE
Single adjustment changes from positive drive to light friction drive ... prevents tap breakage.

No. 1 FRICTION OR POSITIVE DRIVE TAPPER drives 2-56 to $\frac{1}{8}$ " tap in steel or $\frac{1}{4}$ " in aluminum.

No. 2A POSITIVE TAPPER drives $\frac{1}{8}$ " to $\frac{3}{8}$ " tap in steel.

No. 3A POSITIVE DRIVE drives $\frac{1}{8}$ " to $1\frac{1}{4}$ " in steel, $\frac{1}{4}$ " to $\frac{1}{2}$ " pipe taps.

No. 4A POSITIVE DRIVE drives 1" to 2" incl. pipe taps in steel.

All units efficient as production threaders using Round Split, Button, Acorn Dies

Delivery from Stock

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Dorman Machine Tool Works

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MOUNT VERNON, NEW YORK

SPECIFY

Hall... **PRECISION LEVELS**

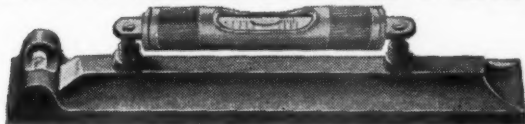


FIG. NO. 5 Adjustable type Machinists' Levels with ground and graduated vial. Grooved for use on shafting. Sizes 4", 6", 8", 12", 18".

"MANUFACTURERS OF
SPECIAL LEVELS
FOR ANY USE."

FIG. NO. 50—For setup and maintenance is accurate to 10 seconds. Graduations are in .0005" per foot. Packed in Instrument Case.

Address Orders or Inquiries to

HALL LEVEL AND MANUFACTURING WORKS

(Established in Geneva, Ohio, in 1913)

1119 E. 4TH

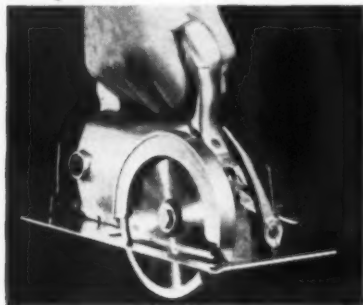
AUSTIN, TEXAS

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

269

GUILD SAW AGAIN BEING PRODUCED BY PORTER-CABLE

The Porter-Cable Machine Co. announces that the 4½" Guild Saw, Model A-4, withdrawn from production during the war, has been re-introduced with several new features. The Model A-4 can be tilted to 45° for bevel or compound mitre cut; an adjustable ripping guide makes fast, accurate ripping simple and fast. The Model A-4 can be used for dadoing, cutting tenons, grooving and notching. It can be raised or lowered into the work. As a safeguard to operator safety, the blade is protected at every angle — teeth are exposed only where they are actually cutting.



This lightweight saw is particularly useful opening crates in receiving departments and general cutting work in shipping and maintenance departments and wherever a handsaw is used.

The Model A-4 Guild Saw weighs

only 6¾ lbs. eliminating operator sawing fatigue, which occurs with the use of handsaws. The capacity of the Guild Saw is a full 1¼" on straight cutting, or 1" at a bevel of 45°. The saw blade is 4½" in diameter, and is driven by a universal motor operating either on A.C. or D.C., up to and including, 60 cycle, standard 110 volt. It is equipped with ball bearings throughout. The overall size of the Model A-4 is: length 10½"; width 4½"; height 8"; shipping weight 10 lbs.

For further information, prices and delivery, write:

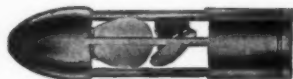
Porter-Cable Machine Co.
1714 North Salina St., Dept. BB
Syracuse 8, N. Y.

SOLVENT CUTS MACHINE DOWN-TIME

A new sludge and gum solvent has been developed by the Swan-Finch Oil Corp. for the users of hydraulic equipment. The product, known as Hydro-Solv "A", can be added to regular hydraulic oils to remedy sluggish operation caused by contaminants. After the recommended 100-150 working hours allowed for the treatment, the system should be completely drained and new oil put in. Gum and sludge, either in solution or suspension, are removed with the dirty oil. There is no necessity of cleaning the system after using the solvent.

Hydro-Solv "A" is a liquid concentrate composed of several highly active organic gum and sludge solvents, selected to perform specific functions when added to a used oil in a contaminated system. The product is not a lubricant in itself and consequently

ILLUMINATED INSPECTION



"Lenox Detects Hidden Defects" while exploring the dark holes of industry — guns, hollow shafts — Refinery, well drill and other tubing, irregular dark spaces.

LENOX INSTRUMENT COMPANY

BORESCOPIES



American Pioneers — Twenty-eight years. Give diameter, length and shape of cavity.

2008 CHANCELLOR ST.
PHILADELPHIA 3, PA.

can not be used neat in a hydraulic system. The product is non-corrosive and will not affect fine surface finishes. Literature is available on this product. Write:

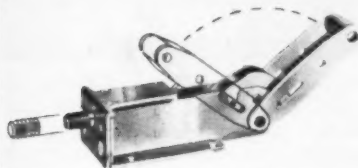
Swan-Finch Oil Corp., Dept. BB
New York, N. Y.

NEW CLAMP EXERTS 800-POUND PRESSURE

A new Push and Pull Clamp, Model P&P-800, announced by Lapeer Mfg. Co., manufacturers of Knu-Vise products.

The device was designed to meet conditions not fulfilled by conventional toggle clamps. It is intended to perform in limited spaces, or under circumstances where the operating handle cannot be accommodated except at some distance from the point of pressure application. It is useful where the plunger must travel under load either pushing or pulling, rather than creating pressure merely at the end of the stroke.

The clamp can exert up to 800 pounds pressure with normal hand operation in either the push or the pull movement of the handle, which will automatically lock and hold work securely upon completion of the handle swing.



It can function as a clamp with the plunger at either extreme, holding parts on milling machine, drilling machine, cut-off saw, etc. or it can be used to exert a continuous pushing or pulling motion, during the entire 1 1/4" travel of the plunger. Auxiliary holes in handles are provided for extensions to facilitate such applications. For complete specifications, write:

Lapeer Manufacturing Co.
Dept. BB
Lapeer, Mich.

SAVE TIME, MONEY

with rugged
**QUEEN CITY
GRINDERS**



A battery of Low-Cost Queen City Grinders is real production insurance. Placed conveniently throughout your plant, they'll stop wasted work-hours caused by "ganging up" around one lone grinder. Low in cost, Queen City Grinders quickly pay for themselves in production gained. Write for Catalog.

QUEEN CITY MACHINE TOOL CO.

235 E. 2nd St.

CINCINNATI 2, OHIO

PLASTICS MOLDING PRESS HAS 500-TON CAPACITY

This large compression semi-automatic plastics molding press was recently built by The Hydraulic Press Manufacturing Co. for a prominent Chicago molder. It has a pressure capacity of 500 tons.

The maximum mold size is 42" x 36". The daylight between platen and head is 54". Maximum ram travel is 26". A large upward acting hydraulic ram is fitted with a small internal booster ram, providing high speed closing up to 320" per minute. Automatic slowdown is provided prior to mold contact. The slow closing speed is adjustable. The press opens rapidly at speeds up to 108" per minute.

This H-P-M compression molding press is also equipped with an automatic breathing or degassing cycle which may be used at the option of the operator. It is equipped with an H-P-M Hydro-Power variable delivery radial, piston type hydraulic pump with direct 25 h.p. electric motor drive through flexible coupling.



The press is equipped with upper and lower mechanical ejectors. The



ROTAB... MACHINING, HOLDING AND CHECKING DEVICE

By having the verniers positioned on the same axes with rotating members, perfect synchronization between readings and controls are assured. Back-lash worries are eliminated. Parts held for checking or machining can be rotated or tilted without changing original clamping. Three sizes of faceplates available: 12", 24", 36".

The Rotab can save you hours of time. All your angle checking can be done with the one clamping.

Send for folder giving full information.

MACHINE PRODUCTS CORPORATION
6771 E. McNICHOLS ROAD • DETROIT 12, MICHIGAN

lower ejectors are manually set. The grids, 8" thick, are attached to both the head and platen.

This press is suited for molding large thermo-setting plastic parts such as radio cabinets, instrument housings and other similar large area parts.

The manufacturer builds a complete standard line of plastics molding presses including 4, 9, 16, and 40 oz. injection machines, also semi-automatic compression and transfer presses from 100 to 300 ton capacities. For complete details, write:

The Hydraulic Press Mfg. Co.
Dept. BB
Mount Gilead, Ohio

SCALING HAMMER REQUIRES SINGLE HAND OPERATION

The Rotor Tool Company announces its new S-1 Scaling Hammer with Lever Throttle, for weld flux scaling, weld spatter removal, paint scaling, rust removal, etc.



The new tool, illustrated, has a lever throttle so that the tool can be held and operated in one hand. This is a convenience for such operations as welding, and is also convenient for reaching into recesses for rapid removal of weld flux scaling. The lever throttle is designed so that light pressure on the lever meters sufficient air for light work, heavier pressure gives full power. The other features of the tool, such as the exhaust air cleaning the work of chips and scale, and the chisel retainer with easy removal by thumb pressure, are the same as the S-1 Scaler with push throttle control.

Chisels are furnished in blanks, flats and spoon shapes, and a full line of star drills is available in sizes of 3/16" to 3/4". For further information, write:

The Rotor Tool Co., Dept. BB
17325 Euclid Ave.
Cleveland 12, Ohio



**"Where can I get the
right motor for this
special job?"**



**"Cleveland Electric Motor
has it...or will make it
for you!"**

*There's a
CLEVELAND ELECTRIC MOTOR
for your every power need*

That's right! We specialize in furnishing motors with special mechanical or electrical specifications: flange-mounted, motors with mounted brakes and motors for operation on odd cycles or voltages. Also standard squirrel cage motors, slip-ring motors, or multi-speed motors for crane, hoist and general purpose applications. These motors are available in either open, enclosed or enclosed fan-cooled frames. All are specially engineered to meet your exact electrical and mechanical requirements.

So whatever your electric power needs—standard or special, large or small—there's a Cleveland Electric Motor that will do the job. Write today for our new price lists.



**SPECIAL MOTORS
FOR SPECIAL PURPOSES**

CLEVELAND ELECTRIC MOTOR CO.
5217 CHESTER AVE. • CLEVELAND 3, OHIO

Pohl

END MILLS

SPECIALLY TREATED

**INCREASE
TOOL LIFE
25%
to
300%**



- ACCURATELY MANUFACTURED
- CLOSE TOLERANCES
- MACHINE GROUND

Pohl End Mills are made of Rex AA improved high speed steel. (18-4-1)

After Pohl End Mills are machined, hardened and ground, a new improved steel treating process is applied. This "Case" is applied to a maximum depth of 2 thousandths, thereby increasing hardness (not brittleness) 4 to 5 points above normal Rockwell hardness. This new process increases tool life from 25% to 300%.

DEALERS WANTED IN PRINCIPAL CITIES

WRITE FOR CATALOG

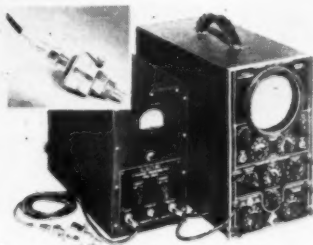
ASH and COMPANY
3939 Grand River Avenue
DETROIT 8, MICHIGAN

NEW ELECTRO DYNAMIC MICROMETER

This device when used with the Du Mont Model 208 Oscillograph or the equivalent, will measure movement, radial displacement or vibration of any part made of ferrous material. The Dynamic Micrometer does not touch the moving part, and therefore, does not interfere with its movement. The displacement is readily read in tenths of a thousandth of an inch with an accuracy comparable to that obtained with a standard micrometer.

Readings are made on a conventional micrometer sleeve about two inches in diameter, which is directly calibrated in thousandths and tenths of thousandths of an inch without resorting to a vernier.

The performance of the dynamic micrometer is independent of acceleration or the frequency of the displacement.



All amplification is done at a constant "carrier" frequency which changes in amplitude with changes in displacement or vibration. The amplifier and oscillograph are used only to establish an amplitude reference level. The frequency responses of the amplifier is not a factor in the accuracy of performance. The accuracy of the dynamic micrometer is the same for a static condition as for a dynamic condition corresponding to speeds up to 200,000 R.P.M. Write to:

Electro Products Labs. Inc.
549 W. Randolph St., Dept. BB
Chicago 6, Ill.



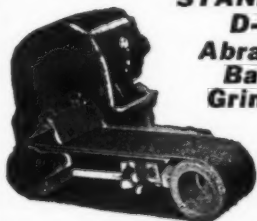
Save time . . . Money . . . Instant stock check-up "INDUSTRIAL" DRILL ROD RACKS

Pick sizes and lengths instantly. Save waste. Fast selection of long or short pieces. Fully indexed in Numbers, Fractions and Decimals. Durable all steel V-slot construction.

NUMBER SIZE — Holds 8 to 10 each of Rods from 1 thru 60, and 3" to 36" lengths 54" Long x 30" High. **\$25.00**
F.O.B. Chicago.

FRACTIONAL SIZE — Holds 5 to 10 each of rods 1/32" thru 17/32" by 64ths. Fractional and Decimal index. 40" Long x 30" High. **\$23.00**
F. O. B. Chicago.

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SATISFACTION GUARANTEED IMMEDIATE SHIPMENT.
INDUSTRIAL TOOL WORKS, 1348 W. Anderson St., Chicago 13



STANDARD D-4 Abrasive Band Grinder

Famous
for
Stamina

This new, streamlined bench type grinder assures fast, quality finishing on metals, plastics, wood, fibre... at low cost. Built to machine tool specifications, Standard D-4 is equipped with improved band tension control and specially designed protective motor hood 4x36 1/4" band. The ideal portable unit.

OTHER STYLES AND SIZES IN NEW
MANUAL ON FINISHING—WRITE TODAY

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Interchangeable
Type and holders
for every
marking
need

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Catalog
5-45

NEW METHOD
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Detroit 7, U. S. A.



All magnesium
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Model B

For twenty years
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Light weight—easy to handle.

Send for circular.

THE NEDCO COMPANY, WALTHAM 81, MASSACHUSETTS

POWER OPERATED HYDRAULIC PUMP

Lyon-Raymond Corp. offers a package type hydraulic power unit that will deliver 1½ gallons of oil per minute



and develop a pressure of 1000 p.s.i. Compactness is made possible by the use of a flange mounted motor placed

directly on top of the oil reservoir. Although the reservoir has an oil capacity of 2½ gallons, the entire pump assembly is only 18¼" high by 12½" in diameter. The unit is furnished with all controls. It is ready for operation as soon as the pressure line is connected and the electric cable is plugged into a standard outlet. Since all controls are electric, the pump can be operated from remote positions if desired. A ¾ h.p. A C motor is used and is available for 110, 220, or 440 volt service. The valves use an "open center" arrangement which permits the motor to idle except when the unit is pumping oil to the pressure line.

The standard unit is furnished with a 3 way valve for operating a single action hydraulic cylinder. Four way valves for operating double action cylinders are available.

Full information from:

Lyon-Raymond Corp., Dept. BB
5855 Madison St.
Greene, N. Y.



SPECIAL FIXTURE GAGES

DESIGNED & BUILT
TO MEET YOUR PRODUCTION
GAGING REQUIREMENTS

OTHER SERVICES WE HAVE TO OFFER

1. Product Design

- a. By working from your sketch we make working drawings for the manufacture of the part.
- b. By changing the design, you can lower manufacturing cost or/and increase production.

2. Plant Layout

- a. We can, by working from architectural blueprints, select and layout necessary machinery and conveyor lines for the complete manufacturing process.

3. Processing

- a. We can determine necessary machinery operations by working from final drawings.

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- a. We design all fixtures, dies and cutting tools to produce parts.
- b. Build and test tools.
- c. Furnish you with complete record drawings and operation sheets for filing.
- d. Design and build special machines for high production parts.

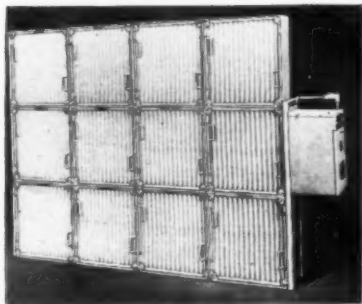
ASSOCIATED DESIGNERS

2450 E. MAPLE RD.
BIRMINGHAM, MICHIGAN

ELECTRONIC AIR FILTER

An electronic air filter, the Electro-PL, has been developed by American Air Filter Co., Inc., Louisville, Ky., with an intermediate cleaning efficiency for applications where the efficiency of a mechanical filter is too low and that of an electronic precipitator is unnecessarily high. The new filter is basically an electronic precipitator without an ionizing unit and contains a collector element of electrostatically charged Airmat paper.

This paper is a laminated cellulose product composed of a number of plies of porous, tissue-like sheets formed of short fibres in "jack-straw" arrangement and is also used as a filtering media in mechanical filters. When an electrostatic charge is applied to the paper, the plies tend to separate and each individual fibre becomes a collecting electrode which attracts and holds dust and smoke particles. This action practically doubles the cleaning efficiency of Airmat paper.



Since the Electro-PL will continue to function as an efficient air filter when deenergized, its operation may be varied to suit the dust condition — as an electronic air cleaner during the winter months when a smoky atmosphere is prevalent and as a dry-type air filter during the summer months. For further details, write for Bulletin 257;

American Air Filter Co., Inc.
215 Central Ave., Dept. BB,
Louisville 8, Ky.

Buy KIPP AIR GRINDERS Because

The RPM's stay up while grinding... not only when the grinder runs idle.

It is an established fact that surface speeds must stay up to approximately a mile a minute if you want to grind — not just rub. The speed of Kipp air grinders drops but slightly when put to work. That means better work — longer wheel life.

Buy Kipp air tools for best results, lower prices.

MODEL JA
50,000 R. P. M.

\$42.00

IN U. S. A.



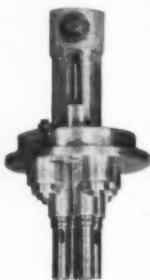
Weight 12 ounces;
length 6 3/4 inches;
chuck size 1/8 inch.
Wheel guard removed for better illustration.

MADISON-KIPP CORP.
207 Waukesha St., Madison, Wis., U. S. A.

• Skilled in DIE CASTING Mechanics
• Experienced in LUBRICATION Engineering
• Originators of Really High Speed AIR TOOLS

SELLEW

CLUSTER ADJUSTABLE FULL BALL BEARING DRILL HEAD



This type of adjustable head can drill holes in circular, straight line or staggered formation. The minimum circle obtainable with this No. 1 AC size is 2", maximum circle obtainable 7". When head is furnished with drill chucks, largest size drill, $\frac{3}{4}$ ", when furnished with taper holes in the spindles, largest drill is $\frac{9}{16}$ ".

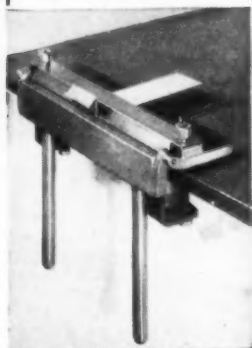
Heads of this type are made in larger sizes with No. 2 and No. 3 M.T. Holes in the spindles.

We also design and build special drill heads, and drilling machines to customer's specifications.

SELLEW MACHINE TOOL CO.

(INC. 1910) — PAWTUCKET, R. I.

10" Portable METAL BRAKE



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\$10.00
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Detroit
No CODs

Immediate
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While
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Maximum capacity 22 gauge 10" wide. Well balanced, easily operated, sturdy construction. Literature on other styles, capacities and sizes up to 24" available upon request. Dealers invited.

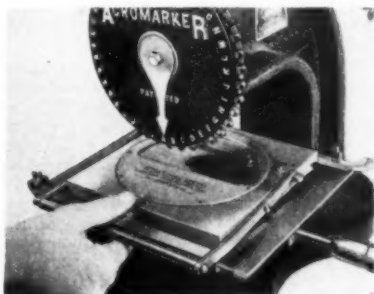
G & S MACHINE SHOP

8700 Grinnell

Detroit 13, Mich.

ACROMARK FIXTURE HOLDS SPECIAL SHAPES

To position, clamp and release special shapes of name plates for stamping them with lettering, The Acromark Co. has developed a new fixture which is adaptable to the holding of a wide variety of shapes and sizes of plates. It can be used in any type of press or the Acromarker



Name Plate Stamping Machine (see illustration).

The device is furnished with flange at the rear to fit under the stamping bar of standard machines or it may be bolted into position for special applications. In operation, the special name plate is placed flat on the fixture when the front rod handle of the lever arrangement is lifted. Upon release of the rod, spring pressure holds the plate in position assisted by four small pins that move upward and lock the plate firmly. Holes in the spring pressure bar permit locating the pins to suit the shape of the special plate or plates.

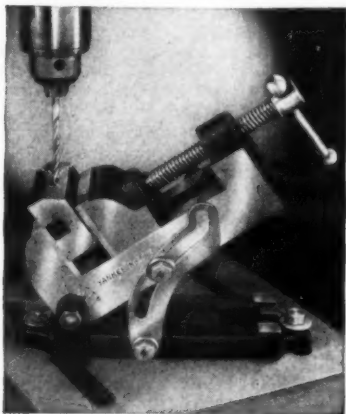
Literature is available upon request. Write:

The Acromark Co., Dept. BB
15 Morrell St.
Elizabeth 4, N. J.

The appointment of **Frederick M. Bock** as assistant to the president of Pioneer Engineering and Manufacturing Co., Detroit, has been announced by A. M. Sargent, president and general manager.

YANKEE ANGLE VISES HAVE WIDE APPLICATION

Useful in a wide variety of machining operations, the "Yankee" Angle Vises have recently been developed by North Bros. Manufacturing Co., a division of Stanley Tools. The vises are applicable as accurate, convenient drilling, tapping and reaming fixtures. For grinding jobs requiring extreme accuracy, the Yankee vises save time and labor in their set-ups. Any angle positions are rigidly held in place. When sawing mitres, bevels, and difficult angles, the vises hold the work true to

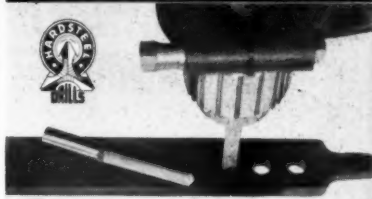


line. The illustration shows a steel rectangular block being drilled at a 35° angle.

These useful tools are available in two sizes, either with or without swivel bases. The swivel base types have base diameters of 3¼" or 4½", respectively. The jaw openings in both types are 1-15/16" and 3", with base lengths of 6" or 8½". A grooved V-block for holding round stock is supplied with each vise. For additional specifications, write:

North Bros. Mfg. Co., Dept. BB
Lehigh Ave. and American St.
Philadelphia 33, Pa

Drill Hardened Steels without Annealing with "HARDSTEEL"



Don't let anyone tell you that hardened steels must be annealed before drilling, countersinking, counterboring or reaming.

With "HARDSTEEL" drills you can produce accurate, smooth holes in steels hardened by any process—oil-hardened, water hardened, cyanided, nitrided, and they work equally well on work-hardening steels and high carbon-high chrome steels of any degree of hardness.

"HARDSTEEL" drills used with standard drill presses cut costs in production shops because parts drilled after hardening always match at assembly. In service shops they save time and material and permit engineering changes calling for additional drilling to be made after parts are full hardened.

Write for a copy of the "HARD-STEEL" Operators Manual showing how "HARDSTEEL" drills are now functioning in thousands of plants in parts recovery operations.

**You Harden It — We'll Drill It —
with "HARDSTEEL"**

**"HARDSTEEL" Tool bits make
faster, deeper cuts on steels
and non-ferrous alloys.**

BLACK DRILL CO., Division Black Industries
1374 East 222nd Street • Cleveland 17, Ohio

"HARDSTEEL"

DRILLS • TOOL BITS • SPECIALS

FOR SALE NEW TOOLING ITEMS!

**DRILLS, High Speed, Straight and
Taper Shank**

DRILL CHUCKS

**GRINDING WHEELS, 2" to 30" O.D.
($\frac{3}{8}$ " to 10" wide)**

ABRASIVE BELTS

**MILLING CUTTERS, Sizes $\frac{1}{4}$ " x $\frac{1}{2}$ "
x $\frac{7}{8}$ " to 8" x 1" x 2" (Inserted
blade type)**

**REAMER BODIES & REAMER BODY
BLADES**

**COUNTERBORES, COUNTERBORE
PILOTS, COUNTERSINKS**

We have at our plant a large supply of these **NEW Tooling Items**, made by **Nationally Known Manufacturers** — Available immediately!

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**13420-A S. Brainard Avenue
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Phone—Bayport 3456

USEFUL GRINDING WHEEL DRESSER

A new 3" Grinding Wheel Dresser which assures accurate grinding jobs by truing up the wheels, thus restoring their original accuracy, and, at the same time, dresses the wheel, improving the cutting action, has been introduced. The new device, called the "Tru-Dress" is a product of Crown Industrial Products Co. The selected abrasives in the "Tru-Dress" give a cutting and truing effect similar to that of a diamond.

In operation, the "Tru-Dress" is brought into contact with the grinding wheel at a slight angle until the dresser starts to rotate. By manually regulated pressure, the operator determines the number of passes across the wheel which give the desired finish. The cutting wheel is securely held and locked in a heavy metal housing which deflects the grinding chips away from the operator. The wheel is mounted on hardened steel bearings protected from dirt and abrasive. Provision has been made for lubrication. Replacement wheels are available, and can be installed on the spot when necessary.



For larger grinding wheels and heavy duty service, a 4" "Tru-Dress" is available. This size has the cutting wheel mounted on high-grade, sealed precision ball bearings which prevent deflection even when run at high speeds. Similar to the 3" size, this unit has a partially removable handle, leaving a straight tool post shank for clamping in the tool holder of a cylindrical grinder.

For complete details on the "Tru-Dress" Wheel Dresser, write:

**Crown Industrial Products Co.
1507 E. 53rd St., Dept. BB
Chicago 15, Ill.**

HIGH SPEED

Automatic

STAKING MACHINE

Here's a machine that will produce in excess of 1000 pieces per hour. Whether it's staking, riveting, eyeletting, burring, etc. this high speed staking machine will deliver the production. Hammer blow is adjustable . . . impossible to trip hammer with finger in die . . . operator's hands are free for work . . . work is held by pressure pad while being struck by hammer. Write for full particulars.



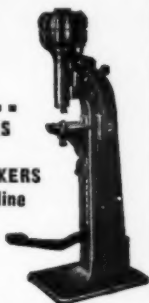
HIGH SPEED HAMMER CO.

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RIVETERS...

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and
PACEMAKERS
in their line



—head rivets from smallest to $\frac{1}{2}$ " diameter either by NOISELESS SPINNING or VIBRATING HAMMER method—Sizes to meet all needs—Types include Vertical and Horizontal Multiple Spindles.

Write for literature and don't forget to send samples.

THE GRANT MFG. & MACHINE CO.

C E Station,

Bridgeport 5, Conn.

★ THE ★ WONDER CUTTER

The lowest-priced wire and rod cutter on the market. The hardened cutters last indefinitely.



Hand operated. A giant for work, cuts wire and rods up to $\frac{3}{8}$ -in. round or $\frac{3}{8}$ -in. square and band iron up to $\frac{1}{2}$ in. by 2-in. Adjustable stop for repeated cuts to same length. Large or small, your shop can use a WONDER CUTTER.

Write today for prices.

THE FEDERAL FOUNDRY SUPPLY CO.

4602 East 71st St.,

Cleveland, Ohio



THREAD ROLLING MACHINE PRODUCES UP TO 150 PIECES PER MINUTE

A high speed Thread Rolling Machine, Model 190-H, is in production by the Roy Manufacturing Co. This machine features simplicity of design, which facilitates its set-up. It has a high production rate of from 110 to 150 pieces a minute, using standard size flat type dies. It will roll threads on a wide range of machine screws, gimlet point screws, self tapping screws and wood screws from No. 2 to No. 10 wire size.

The unit is provided with a large hopper with full automatic feed. The slide and pitman are frictionless pressure lubricated. All rotating parts run in frictionless bearings. The machine is of rugged, compact construction. For additional details on this new machine, write:

Roy Manufacturing Company, Dept. BB 5 Mill Street, Webster, Massachusetts



NEW MERCURY HYDRAULIC PRESS

The addition of a new hydraulic press to its line of paper converting machinery is announced by the Mercury Engineering Corporation. This press is known as the Mercury Series H Hydraulic Press. Since its development, uses have been found in many fields

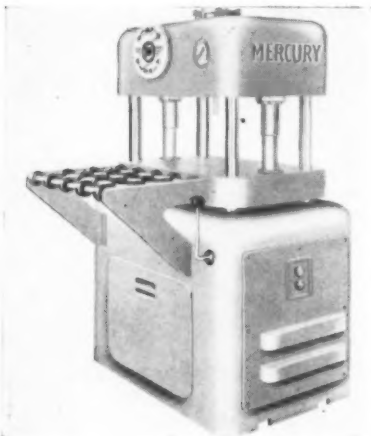
including leather, sheet metal, veneer and plastics.

A feature of this press is the traveling lower platen which moves vertically under hydraulic pressure. The upper platen carries the dies in fixed position and is provided with either air or spring knockouts to facilitate unloading.

Ruggedness is evidenced by its all welded, modern heavy duty construction. To effect economy of space, its self contained hydraulic unit is totally enclosed in the base. All controls are panel mounted. Versatility and ease of operation characterize this new Mercury hydraulic press. The Model HD-25 machine has a 20" x 24" upper and lower platen and is rated at 25 tons with fifteen 1" strokes or three 5" strokes per minute. The stroke of the press can be varied from 0-5" by simple hand control at the front of the press.

Other Mercury models in this series will provide pressures up to 65 tons and strokes to 6". For additional information:

Mercury Engineering Corp., Dept. BB
2100 N. Farwell Ave.
Milwaukee, Wis.



Announcing NEW...

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GROUND FLAT STOCK

Now Available From Stock

Write for New Catalog . . . Just off the Press

BOX 58-B

MARSHALL STEEL
LISLE, ILLINOIS

HYDRO-LIFT CRANE HAS 2000-POUND CAPACITY

The Cardinal Corp. announces its new Hydro-Lift Crane. With its 2000-pound



capacity, the Hydro-Lift is useful in machine shops, industrial plants and foundries. The manufacturer states that

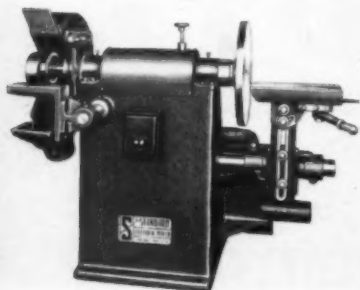
the crane's 45" boom facilitates installing or moving shop equipment. If greater boom length is desired, an 18" extension arm may be attached. A special locator pin locks the boom in proper working position. Double acting hydraulic pump converts every movement of pump handle into lift motion. The unit requires little effort to hoist heavy loads. Neoprene oil seals resist corrosion, and will not leak. The crane holds loads at any height.

Fabricated of formed steel, the frame provides a stable platform for heavy loads. Three rubber-tired roller bearing wheels permit loads to be moved quickly and easily. Placing the towing handle in upright position automatically sets brake, and prevents the crane from moving when lowering or hoisting loads. Additional information will be sent upon request.

The Cardinal Corp., Dept. BB
St. Paul, Minn.

STANDARD GRINDERS FEATURE THRUST BEARING CONSTRUCTION

The Standard Electrical Tool Co. has redesigned their line of Combination Grinder-Disc Grinders. These machines have a self-contained belted motor drive. The enclosed ball bearing



motor is on an adjustable bed plate attached to the rear of the pedestal. Power is transmitted through multi-

ple V-belt drive. The guards for both the straight grinding wheel and the disc grinding wheel are of structural plate steel. The left hand side is arranged for a maximum of 24" x 3" x 1 3/4" grinding wheel powered by a 10 h.p. motor. The smallest size is 10" with a 1 h.p. motor. The right hand side is arranged to accommodate plate mounted disc grinding wheel, from 24" to 10" diameter depending on size of machine. Optional equipment is either the Lever Feed Universal Table or a Plain Swivel Table.

A feature of this new design is the Thrust Bearing construction by which it is no longer necessary to dismantle the spindle assembly to take up bearing wear. This is conveniently accomplished by an external adjustment. Details furnished on request to:

The Standard Electrical Tool Co.
2486 River Rd., Dept. BB
Cincinnati 4, Ohio

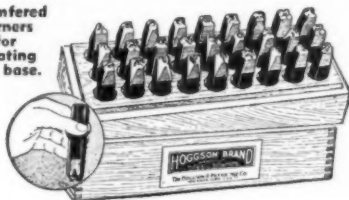


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Since 1849

HAND-CUT STEEL STAMPS Letters & Figures

Deep, hand-cut letters in special-formula steel—result of 90 years of die making—assure clean impressions and long service. Face of stamp is angled for extra strength. Ideal for parts and tool marking and numbering. Also made in reverse for marking molds and dies. At mill supply houses.

Chamfered
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for
locating
the base.

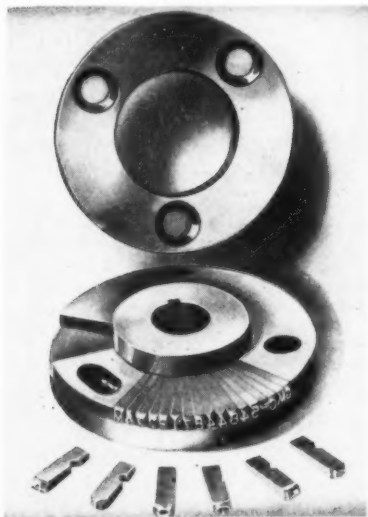


HOGGSON & PETTIS MFG. CO., New Haven, Conn.

ACME ROLL TYPE HOLDERS

Acme Roll Type Holders, with interchangeable type inserts, are available in any size for use with marking machines or lathes. Rolling the impression on, one character at a time, is said to provide a greater measure of control and to result in a minimum of distortion of the material marked. Stress on part and wear on die are also reduced. A special feature of the Acme Roll Type Holder is a compensator segment with an elongated hole which permits locking lines of any length and does away with the need for spacers, while eliminating all play.

Three general styles of Acme Roll Type Holders are available: Style D, providing for a single line of completely



interchangeable type (as illustrated); Style E providing a double line of interchangeable type and type segments; and Style F, a solid roll die combining permanent markings with interchangeable type and type segments. Complete information from:

**Acme Marking Equipment Co., Dept.
BB. 8030 Lyndon, Detroit 21, Mich.**

Drill-Cut-Chip Concrete and Masonry 10 Times as Fast

with

SYNTRON

DEPENDABLE

ELECTRIC HAMMERS

SAVE MONEY AND TIME

Drilling Bolt Holes to Anchor Machinery and Shafting.

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—and a host of other time
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Illustrated folder on request

SYNTRON CO. 3000 Lexington
Homer City, Pa.

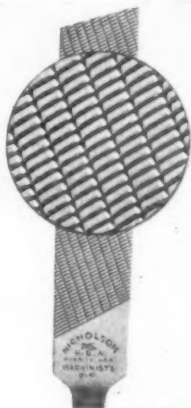


GENERAL PURPOSE MACHINIST'S FILE

Nicholson File Co., announces the new Machinist's G. P. (General Purpose) File, designed for use on aluminum, bronze, cast iron, malleable iron, mild steel and annealed tool steel. In designing this file, Nicholson engineers had in mind the machinist who has good use for a single tool of sufficient versatility to rough and finish various metals. The G. P. has single cut teeth, comparable to those of a regular Mill Bastard, divided by angular serrations into shorter cutting edges which remove stock rapidly and still leave a smooth finish.

Tests show that, in addition to general machine shop filing, the G. P. stands up well under the severe usage of foundry work. G.P. Files are available in lengths of 8", 10", 12" and 14" and in one degree of coarseness only. They are cut on flat blanks which taper in width, but not in thickness. For details, write:

Nicholson File Co., Dept. BB, 16 Acorn St., Providence 1, R. I.



SINGLE CYLINDER PUMP AND NOZZLE COMBINATION

A new single cylinder pump for diesel engines in the 5-15 h.p. range is announced by Ex-Cell-O Corp. The pump is designed to be used for one and two-cylinder small high speed diesel engines. Designated as Model "S", it is available in a range of plunger diameters from $\frac{1}{4}$ " to $\frac{3}{8}$ ", depending on engine requirements.

The combination of this new pump and the Ex-Cell-O nozzle makes a reliable injection system available for small engines. An outstanding design feature of the nozzle is the elimination of drain lines. The nozzle is factory-adjusted and calibrated. The illustration shows the new single-cylinder pump fitted with an Ex-Cell-O nozzle and holder assembly of the threaded type. Further information on the new single-cylinder Model "S" Pump and Ex-Cell-O Nozzle may be obtained from:

**Ex-Cell-O Corp.
Fuel Injection Div., Dept. BB
Detroit 32, Mich.**



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The COLOR tells the THICKNESS

ARTUS Arbor Spacers made of plastic in various colors identify thickness at a glance! .001, .0015, .002, .003, .005, .0075, .010-.030. Speed up accurate fitting at low cost. Write for folder.

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Handy Spacer Assortment

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100 SPACERS IN ALL

$\frac{7}{8}$ " — \$3.10 $1\frac{1}{4}$ " — \$3.80
1" — 3.35 $1\frac{1}{2}$ " — 4.70

Other standard sizes also available.

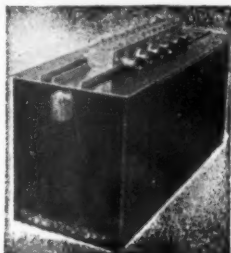
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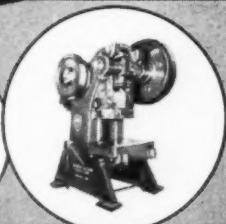
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16 TO 90 TONS**



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News of the **INDUSTRY** **APPOINTMENTS AND PROMOTIONS**

HITCHCOCK TO OCCUPY NEW PLANT

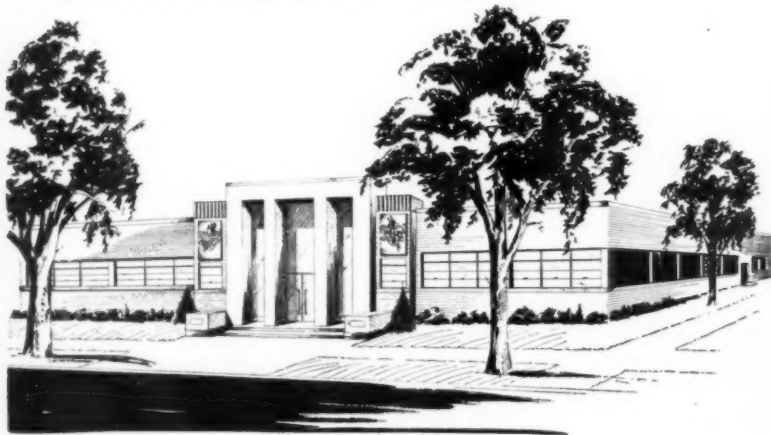
The Hitchcock Publishing Co., publishers of **MACHINE** and **TOOL BLUE BOOK**, **WOOD WORKING DIGEST**, and **RESALE** magazines, and its book division, the **VAN KAMPEN PRESS**, will move into their new quarters on September 24th. The new building, which covers an area of 13,000 square feet, is located in Wheaton, Ill., a suburb of Chicago. It is easily reached by the Chicago, Aurora and Elgin Railroad which daily provides 82 trains between Wheaton and Chicago.

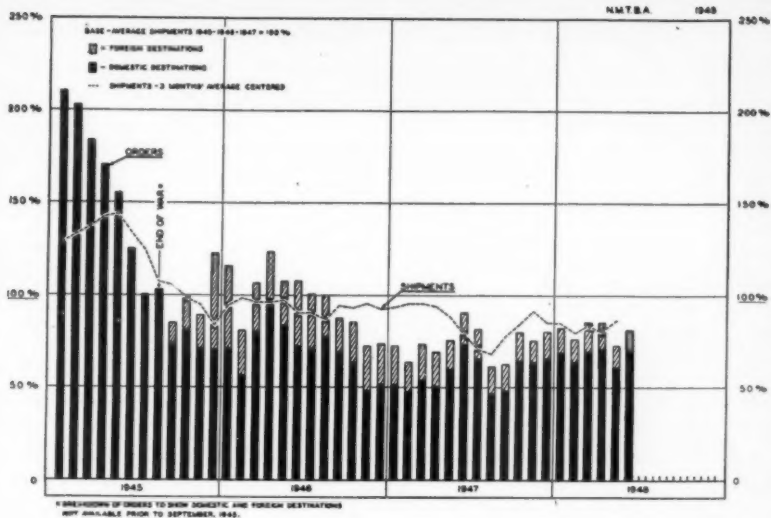
Construction of the building was undertaken in late Spring to avoid constantly rising rents. The building will house the general offices, and the typesetting de-

partments. Sufficient storage for plates has been designed into the building to accommodate advertisers and advertising agencies.

Employees who previously had to spend valuable time driving or commuting into the city from western suburbs, and pay excessive parking or transportation costs, will now drive to work in a matter of minutes. Offices are modern and well lighted. Radiant heating is used throughout the plant.

All communications addressed to Hitchcock Publishing Co. after September 24th, should be sent to 222 East Willow Avenue, Wheaton, Ill. The telephone number is Wheaton 3400.





Index of New Orders and Shipments of Machine Tools

Base — Average Shipments 1945-1946-1947 = 100%

Date	New Orders (Total)	Foreign Orders (Included in (Total)	Shipments (3 Months' Average) (Centered)
1948			
Jan.	83.1	14.0	86.9
Feb.	77.3	12.7	81.9
Mar.	86.3	16.1	84.2
Apr.	86.3	14.1	82.7
May	73.5	11.4	p 86.6
June	p 81.8	p 11.9	

p — Preliminary figures

NEIL C. HURLEY SR., DIES AT 78

Neil C. Hurley, 78, chairman of Independent Pneumatic Tool Co., and co-founder of the Hurley Machine Co. Chicago firms, died at his home Aug. 3, 1948 as a result of a heart attack. Hurley began his working career in 1894, as a mail clerk in Galesburg, Ill. Later, he and his brother, Edward N. Hurley, organized the firm bearing their name, a pioneer manufacturer of home electrical devices.

MERZ ACQUIRES RIGHTS TO JACK & HEINTZ

Merz Engineering of Indianapolis, manufacturers of precision gaging equipment and special machines, has acquired exclusive patent, manufacturing and sales rights to the line of Jack & Heintz electronic inspection equipment. The line is being marketed under the designation of Merz New-Tronic Gages and Sorting Machines.

GIDDINGS & LEWIS BUYS CINCINNATI PLANER CO.

It was announced on July 30, 1948, that the Giddings and Lewis Machine Tool Co., Fond du Lac, Wisconsin, purchased all of the capital stock of the Cincinnati Planer Co., Cincinnati, Ohio. The announcement was made by Ralph J. Kraut, president and general manager of the Wisconsin firm. Actual figures involved were not disclosed, but stockholders of Giddings and Lewis received proxy notices giving the purchase price at \$3,000,000.

Mr. Kraut has been elected president of the new acquisition. Other officers are: M. H. Daum, Cincinnati executive, vice-president and general manager; W. E. Rutz, Fond du Lac, vice-president; R. J. Steiner, secretary and controller; R. E. Hanson, treasurer and counsel; R. D. Allison, assistant treasurer and assistant secretary; E. W. Kroeger, assistant sales manager; C. J. LaMoth, executive assistant; W. B. Wigton, chief electrical engineer; J. W. Knippling, purchasing agent; J. G. Daum, production manager.

The board of directors of the Cincinnati company will consist of Mr. Kraut, Mr. Rutz, Keith F. Gallimore, of Fond du Lac, J. Roy Porter, Chicago, Jos. M. Conway, Green Bay, William E. Buchanan, Appleton, J. H. Daum, and Attorney Hanson.

The Cincinnati Planer Co. was formed as a partnership in 1898; in March 1899, the business was incorporated with a capital of \$30,000, and was named the Cincinnati Planer Co. It enjoyed a

steady growth from its beginning, and built an international reputation for its products. Its original line was supplemented in 1908 with a line of vertical boring mills, and of planer type milling machines in 1925. Sales are handled through exclusive dealers, both domestic and foreign.

Present facilities of the plant, which underwent its most recent expansion in 1942, comprise a floor space of 105,000 square feet. Its employs approximately 400 persons. The corporate entity will be retained, and it will continue to operate in Cincinnati as a subsidiary of the Giddings and Lewis Machine Tool Co.

PANNIER ANNOUNCES REORGANIZATION

The incorporation of the former Pannier Bros. Stamp Co., 207-209 Sandusky St., Pittsburgh 12, Pa., under the new name, The Pannier Corporation, has been announced by company management. The change is one of name only.

G & H Collet type INDEXING FIXTURE

Faster finishing of multi-machined precision parts.

G & H fixtures speed machining of pieces requiring similar operations on one machine. Precise production on straddle, plain milling, slotting, drilling, tapping. 2-3-4-6-8-12 & 24 Divisions with one Index plate. Many other features.

G & H MFG. CO.
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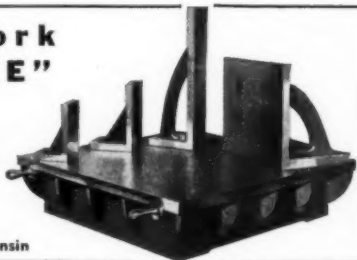


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J. C. BUSCH COMPANY

Engineers and Machinists Since 1907
165 S. Barclay Street Milwaukee 4, Wisconsin



It does not involve any change in the firm's structure, its personnel, its policies, or any of its activities in the design, engineering and manufacture of all types of marking equipment for industry. The new Corporation still retains the Pannier "Master Marker" Trade Mark which it has used since shortly after the original company was founded in 1899.

The following officers have been elected: Ralph A. Pannier, President; George W. Pannier, Vice President; Carl O. Pannier, Secretary and Treasurer. W. J. Pannier, Jr. is now Chairman of the Board, and O. M. Pannier, Vice Chairman of the Board. Other officers are: John J. Ely, Purchasing Agent, and Harry W. Ehrlen, Advertising Manager.

KEARNEY & TRECKER BUYS WALKER-TURNER CO.

Kearney & Trecker Corp. of Milwaukee, one of the world's largest builders of machine tools for milling and boring, has purchased the Walker-Turner Co., Inc. of Plainfield, N. J. Announcement of the outright acquisition was made by Francis J. Trecker, president. The eastern company manufactures a line of light machine tools for industrial and home workshop uses.

The Walker-Turner plant, which will continue its operations as the Walker-Turner division of Kearney & Trecker, occupies 180,000 sq. ft. and employs about 400 persons. All facilities will remain in Plainfield and general supervision will continue under the present management.

Established in 1922 by Ernest T. Walker and William B. Turner, the company confined its efforts during the first 10 to 15 years principally to the manufacture of light woodworking tools intended chiefly for home workshop use. Since 1937 emphasis has been entirely upon light machine tools of a higher quality and precision for wood and metal for industrial application. Following the war, however, the home workshop demand for these tools has greatly increased so that their use is becoming more widespread in both the industrial and home workshop fields.

Kearney & Trecker earlier this year celebrated its 50th anniversary. (See July Machine & Tool Blue Book, pp. 212-13) It was organized as a partnership in 1898 between Edward J. Kearney and Theodore Trecker, and its products are to be found wherever metal-working industries are located throughout the world. The company employs approximately 1700 persons.



Ralph A. Pannier



Edwin R. Fellows, II

FELLOWS LEAVES FOR EUROPE

Edwin R. Fellows, II, Export Sales Manager of The Fellows Gear Shaper Co., Springfield, Vermont, left in July for a six months' business trip in Europe. His itinerary includes England, France, Holland, Switzerland, Italy, Norway, Finland, Austria and Czechoslovakia.

SEMI-ANNUAL ASTE MEETING

"Progress on the Pacific" will be the theme of the Semi-Annual Convention of the American Society of Tool Engineers, according to an announcement by Harry E. Conrad, Executive Secretary. The meeting will be held October 11, 12, 13 in Los Angeles with headquarters in the Biltmore hotel.

More than 1,000 tool engineers from all parts of the United States and Canada are expected to gather in Los Angeles to study the newest developments in tools and machines and how they are being utilized in the expanding West Coast industrial picture.

Technical sessions are scheduled for the evenings of October 11 and 12, to be followed on October 13 by the Na-

tional Banquet. In the first session Hall Hibbard, Vice President and Chief Engineer of the Lockheed Aircraft Corporation, will present "Adventures in Space," a discussion of aircraft development and jet propulsion.

Subject of the October 12 session will be "Petroleum Industry—Tooling, Refining." The six leaders in the industry who will speak and their topics are: Gordon Jackson, Vice President and General Manager, Eastman Oil Well Survey Company, Denver—"Whipstocking"; William G. Owsley, Chief Technical Advisor, Halliburton Oil Well Cementing Company, Duncan, Okla.—"Oil Well Cementing"; H. N. Marsh, Production Engineer, General Petroleum Corporation, Los Angeles—"Oil Field Standardization"; A. C. Rubel, Vice President, Union Oil Company of California, Los Angeles—"Exploration"; D. S. Faulkner, Vice President, National Supply Company, Torrance, Calif.—"Technical Aspects of Drilling"; O. N. Miller, Standard Oil Company of Cali-

fornia, San Francisco—"Refining."

Tours of leading industrial plants in the Los Angeles area make up the daytime Convention program. All day tours have been scheduled with an eye to combining business with pleasure. On October 11, ASTE members will see the new Ford plant and will visit the Los Angeles harbor. An all-day tour of Kaiser Steel Corporation will include a scenic trip through the countryside on October 12. For the final day, a motion picture studio tour and a visit to the beach area are on the program.

HARTFIELD-HEALY REORGANIZES SALES AND SERVICE STAFF

The Hartfield-Healy Supply Company, 190-194 Main Street, Buffalo, N. Y. celebrated ten successful years in the industrial and mill supply business this week with a completely reorganized and shop-trained sales and service staff ready for the field, Edwin E. Healy, partner and company sales manager reports.

A JIG OR FIXTURE IN 5 MINUTES! with the MATCO Universal Vise

AND ATTACHMENT

Saves money and time on jigs or fixtures on most short run machining or grinding operations.

"THE VISE THAT PAYS FOR ITSELF ON THE FIRST JOB"

Available in 3 1/2" and 4 1/2" sizes

(Arrow, in illustration, points to precision angle adjustment screw.)

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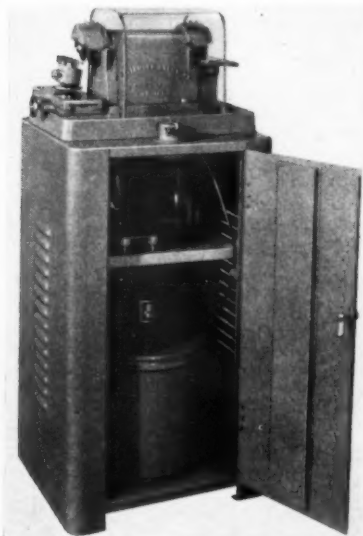
for DRILLING
COUNTER BORING
TAPPING
REAMING
GRINDING



Est. 1934
Mrs. Complete Line
Precision Vises and Radius Dressers

INEXPENSIVE CARBIDE GRINDER ANNOUNCED

The new carbide grinder, announced by the United States Diamond Wheel Co., features small diameter wheels and accommodates tools having up to 1" shanks. The grinder is equipped for



wet grinding and has a grinding spindle engineered to run smoothly at 9000 RPM which gives a higher surface speed to smaller, less expensive wheels, making them cut faster and perform more efficiently. The spindle is mounted in a removable cartridge type ball bearing unit.

The diamond wheel has a full $\frac{3}{4}$ " wide grinding wheel surface for off hand grinding and is placed at a convenient operator height to obviate fatigue. Table angles are easy to read. An all-angle vise gives quick set-ups for chip breaker grinding. There is no shimming of the tool.

The grinder is equipped with cabinet, 1/3 h.p. motor, coolant pump, wheel guards and 1 diamond wheel. Height to spindle is 46"; floor area is 24" x 24";

shipping weight, approximately, 275 lbs. The grinder is suitable for grinding of clearance angles and chip breakers on single point tools and inserted blades and milling cutters. Obtainable in single end, double end, or single and chip-breaker models. The single end model is priced at \$285. For further information write:

**U.S. Diamond Wheel Co., Dept. BB
Aurora, Ill.**

USEFUL MICROMETER ATTACHMENT

The Rimat Microdapter is an attachment for outside micrometers which makes possible the measuring of internal dimensions. Developed by the Richards Machine Tool Co. the Microdapter meets a machinist's need for an inexpensive tool which is as accurate as the micrometer to which it is attached. With it, internal measurements can be taken with speed and accuracy and the elimination of error encountered when using telescopic gauges or conventional inside micrometers.

The Microdapter can be installed or removed in less than one minute. It is precision made of all-steel construction. Measuring tips are bright, hardened tool steel, with the rest of the finish blue-black. The tool is guaranteed as to workmanship, materials and use satisfaction. For further information, write:

**Richards Machine Tool Co.
Dept. BB
Glendale, Calif.**

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Manufacturer's Representatives

Our client has territories open for representatives to sell fast-moving line of essential machine tool items. Only those experienced selling to industrial trade and mill supply houses need apply.

Address All Replies To

**EDWARD G. KENNEDY, ADVERTISING
159 E. Chicago Avenue, Chicago 11, Ill.**

Appointments & Promotions

The appointment of **David K. Colesberry** as General Sales Manager of The Harrington & King Perforating Co., Chicago was announced by Foye P. Hutchinson, President. Colesberry comes to Harrington & King after twenty-two years with The Sharples Corp., centrifugal and process engineers of Philadelphia.



David K. Colesberry



John H. Roehm

L. A. Young, Jr., president of Bowen Products Corp., Ecorse, Mich., and Auburn, N. Y., announces the appointment of **John H. Roehm** as sales manager of the division of the firm manufacturing lubricating devices for the automotive, aviation, and other industries.

The appointment of **J. Ralph Griffith** as sales manager of the Pioneer Pump and Manufacturing Co., Detroit, has been announced by A. M. Sargent, president and general manager.

Harold F. Smiddy has been appointed general manager of the Chemical Department of General Electric Co., it was announced by Charles E. Wilson, President, and Dr. Zay Jeffries, Vice-President in charge of the Department. Mr. Smiddy's headquarters will be in Pittsfield, Mass.

Ralph C. Stuart, vice president, announces the appointment of **Russell E. Ebersole** as general manager of lamp sales for the Westinghouse Electric Corp., Bloomfield, N. J.

Kennametal Inc., Latrobe, Pa., manufacturers of cemented carbide tools, has appointed **Gerald Bogner** engineer and representative working out of the company's New York office.

J. M. Moon, sales manager of Signode Steel Strapping Co., Chicago, announced the appointment of **Milton C. Carlson** to the post of assistant sales manager in control of the field organization.

Appointment of **Myron S. Curtis** as director of engineering of The Warner & Swasey Co., Cleveland, O., was announced following a recent meeting of the board of directors at which Mr. Curtis and **Frank E. Joseph** were elected directors. Mr. Curtis succeeds W. J. Burger, who retired June 30th from his posts as director of the company and director of engineering. Mr. Joseph is a member of the law firm of Jones, Day, Cockley and Reavis, and succeeds his late partner, Thomas E. Jones.

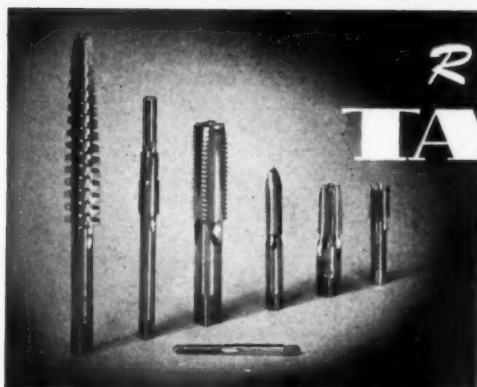


Myron S. Curtis



George Squibb

The appointment of **George Squibb** to the position of chief engineer of the Detroit Broach Co. was announced by Gustav von Reis, president. Mr. Squibb will replace Leon Caplen who is resigning after thirteen years as chief engineer; Caplen will continue to be associated with the firm in the capacity of consulting engineer.



R & N TAPS

Decrease Overhead

Offset increased cost of manufacturing by using R & N Ground Thread Taps.

They must be right!

Send for Reiff & Nestor Catalogue and Tapping Guide. A request on your Letter Head brings it.

Next time try R & N Taps.

REIFF & NESTOR COMPANY

manufacturers of TAPS AND REAMERS
LYKENS, PA.



MODEL 1236
36 IN. THROAT
12 GAUGE
CAPACITY

CIRCLE
CUTTING
ATTACHMENT
Included as
STANDARD
EQUIPMENT
with this
machine

LIBERT MACHINE CO.
GREEN BAY • WISCONSIN

for BETTER PRODUCTION and MAINTENANCE *at lower cost*

A proved time-saver in any sized shop; Libert's *flexibility* gives you a wider variety of work—clean shearing of flat or formed sheet metal... straight or irregular shapes... inside or outside cuts. Libert *simplicity* means that even unskilled labor soon does accurate work, lots of it *and fast!*

Write for bulletin.

Made in sizes up to 60 in. throat, 10 gauge capacity

Libert *Hi-Speed* SHEAR

C. I. Hayes, Inc., Providence, R.I. announce the appointment of **Leonard J. Edwards** as New England sales representative for their line of industrial electric heat treating and hardening furnaces.

The Worthington Pump and Machinery Corp. announces appointment of **Harold T. Anderson**, as assistant to the General Sales Manager, in charge of Sales Production Relations, with headquarters at Harrison (N. J.) Works.

Appointment of **Raymond G. Schiele** as buyer for the General Electric Co.'s Resin and Insulation Materials Division, Schenectady, N. Y., is announced by J. C. Morris, division superintendent.

Appointment of **A. L. Hawk** as assistant to the Western District manager in Chicago and **R. B. Hazard** as manager of Distributor Sales, Western District, has been announced by Raybestos-Manhattan, Inc., Manhattan Rubber Division, Passaic, N. J.

Victor W. Blackney, formerly assistant general manager of sales, has been appointed director of sales in the Distribution Division of United States Radiator Corp., Detroit, Mich., it was announced by Wesley J. Peoples, president of the company.

Iron & Steel Products, Inc., Hegewisch Station, Chicago 33, announces the election of the following officers: **John F. Parker**, President and Treasurer; **W. J. Parker**, Executive Vice-President and Secretary; **Charles A. Marshall**, Vice-President and General Manager.

Benjamin F. Fairless, president of U. S. Steel corporation, has announced the election of **Walter C. Hemingway** as president of the Pittsburgh Steamship Co., succeeding the late A. H. Ferbert.

United States Rubber Co. has announced the appointment of **Jack Suttie** as special grinding wheel representative for the middlewest and southwest.



The Quick, Easy, Handy Way to TAP BY HAND

The DAHLSTROM TAP GUIDE virtually eliminates tap breakage—and saves those costly hours spent prying broken taps out of dies. Saves time, too. Just a few turns of the handle and the job is done. Winds through continuously, with no back-off. Work is always dependably straight and square.

This handy tapper comes equipped with 7 adaptors, 8-32 to 1½", but taps are not furnished. Attaches to any post or bench. 12" x 6" x 14", wt. 28 lbs. At mill supply houses, or from Dahlstrom Mfg. Co., 416 South 6th St., Minneapolis 15, Minn.

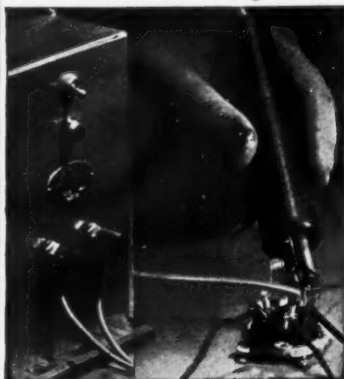
SEND FOR FREE CIRCULAR: "Tap Breakage Reduced"



Dahlstrom TAP GUIDE

\$52.50
F. O. B.
Minneapolis

LUMA Soldering Tool

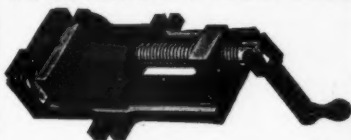


RESISTANCE TYPE

A proven tool for all soldering jobs large or small. Heats instantly—low maintenance. Safe to operate. Write for details.

LUMA ELECTRIC EQUIPMENT CO.
P. O. Box 132-H TOLEDO 1, OHIO

YOST DRILL PRESS VISE



This new Yost vise has been designed expressly for use on drill press operations. Does away with special and costly jig fixtures.

Offered in two sizes.

Vise No.	Width of Jaw, inches	Opens, inches	Weight, Pounds
1D	3½	3½	12½
2D	5	5½	23

Do you need a vise of ANY type?

Write today for bulletins on the extensive Yost line

YOST MFG. COMPANY
1335 SO. MAIN ST.
MEADVILLE, PENNSYLVANIA



Universal Stock Reel

The Humm Universal Stock Reel is an essential device for the handling and feeding of coil stock to Power Presses.

1. Adjustable Reel to fit various sizes of coil.
 2. Reel is adjustable to suit height of Press.
 3. Reel can be inclined to any position.
- Stock Reel with plain bearing \$55.00
Stock Reel with roller bearing \$65.00

Manufactured By

John Humm Safety Equipment Co.
253 SHEFFIELD AVE., BROOKLYN 7, N. Y.

NIELSEN Heavy Duty

*Live
Centers*

*Write for
catalog on
live centers*

Adapted
for heavy
duty work.
Precision type
ball and roller
bearings assure
maximum capac-
ity for high speed
production and long
service.

NIELSEN, INC. LAWTON, MICH.

TOUGH OVERLAYS and PATCHES

for

Wood or Concrete Floors



Resurface or patch broken concrete floors with tough RUGGEDWEAR resurfacer. Here's a material which will stand up under the most punishing traffic conditions. Simple to install—no chopping or chipping required. Merely sweep out the spot to be repaired—mix the material—trowel it on. Holds solid and tight right up to irregular edge of old concrete. Provides a firmer, tougher, smoother, more rugged wearing surface. Used indoors or out. Dries fast.



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OFFER**



FLEXROCK Co.,

3634 Filbert St., Philadelphia 4, Pa.

Offices in Principal Cities

Please send me complete RUGGEDWEAR information . . . details of TRIAL ORDER PLAN—no obligation.

Name

Company

Address

Dr. Zay Jeffries, vice-president of the General Electric Co., Pittsfield, Mass., has announced the appointment of **George P. Lehmann** to his personal staff with duties as assigned, and the appointment of **Robert L. Gibson** to succeed him as manager of the Company's Plastics Division.

Benson Reark has been appointed Factory Superintendent of Potter & Brumfield of Princeton, Ind., manufacturers of relays and synchronous timers. Mr. Reark has recently served as Staff Engineer for Fred Heath Inc., management engineers.

Election of **J. Douglas Darby** as sales vice-president of Carnegie-Illinois Steel corporation has been announced by C. R. Cox, president of this U. S. Steel subsidiary. He succeeds Thomas J. Hilliard, who recently resigned.

Detroit Broach Co. announces the appointment of the **Coats-Moore Supply Company**, 804 South Main St., Memphis 2, Tenn. as representatives effective June 1st. The Coats-Moore company will cover the state of Tennessee; Five counties in Alabama; and six counties in Mississippi.

The Harrington & King Perforating Company today announced the retirement of **J. M. Fuller** as president after 62 years of service with the company. **Foye P. Hutchinson** was elected president, **Judson E. Fuller** as vice president and treasurer and **S. Harrington Jr.**, secretary.

At a recent Board of Directors meeting, **Whitley B. Moore** was elected vice president in charge of sales of the Timken Roller Bearing Co., Canton, Ohio. He succeeds **L. M. Klinedinst** who has retired after 43 years of service.

Washington Steel Corp. announces the following appointments: **John C. Richards**, as general manager of sales; **Robert O. Fulton**, as assistant sales manager; **S. M. Gough**, as sales representative. All three will make their headquarters at the home office in Washington, Pa.

● **PORTABLE
ELEVATING TABLE**



**Saves
TIME
and
LABOR**

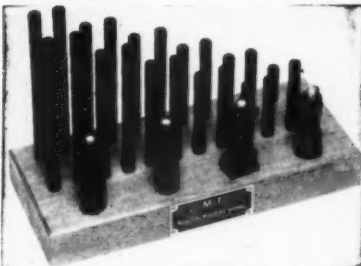
- Eliminate heavy lifting and cut handling costs. Slight foot pressure varies height up to 15½", leaving operator's hands free. Table swivels and locks in any position.

- SEND TODAY FOR ILLUSTRATED CATALOG NO. 2

- **MIDWEST TOOL & ENG. CO.**
● 112 WEBSTER ST., DAYTON, OHIO

M-T

**41 PIECE
SET-UP NUT
and STUD SET**



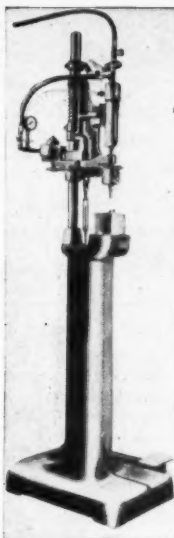
**AT YOUR FINGER TIPS
WHEN YOU WANT THEM.
TOUGH—THEY CAN TAKE IT.**

1/4" Set	\$21.00
3/8" Set	23.00
1/2" Set	26.00

Standard equipment for every machine tool.
Immediate Delivery.
fob Ferndale Plant.

Write for Catalog and Templates on M-T Fixture Clamps and Components.

Morton Machine Works
2422 Wolcott Detroit 20, Mich.



**PNEU - SPIN
RIVETER**

*fully
pneumatic*
AIR MOTOR

Interchangeable heads with Capacities: 3/32", 5/32", 1/4" and 5/16"

Speeds 4,000 to 10,000 stroke blows per minute
... Assembles metals, wood, rubber, die cast, fibre, porcelain, plastics, etc. ... Throat depth 4¼" ... Motor consumes 6 c.f.m. @ 25 p.s.i. ... Send unriveted sample parts or prints for quotation.

Write for Bulletin 48

SCHLACK

Manufacturing Co.

13257 Birwood

Detroit 4, Michigan

**NEW BAND
SAW BRAZER**



**SAVES TIME
AND MONEY ...**

better than welding—easy to use—operates on 60 cycle lighting circuit. Complete kit includes resistance brazer, silver solder, flux, and instructions.

Introductory **\$18.50**
price

THE ERWOOD COMPANY
214 WOODSTOCK STREET
CRYSTAL LAKE, ILLINOIS

Ralph T. Brengle, President of the National Association of Relay Manufacturers, has recently announced that effective July 1, 1948, he will devote his full time to Potter & Brumfield, manufacturer of industrial relays, 549 W. Washington Blvd., Chicago 6, Ill.

Barber-Colman Co., Rockford, Ill., announces the appointment of **John C. Preston**, Preston Machine Tool Sales Co., as exclusive distributor for Barber-Colman Hobbing Machines, Hob Sharpening Machines, Hobs, Cutters and Reamers, in the state of Texas.

The B. C. Ames Co., Waltham 54, Massachusetts, announces the appointment of the following exclusive representatives to handle their complete line of micrometer dial gauges and indicators: In northeastern Ohio, the **Sybrandt Co.**, 4500 Euclid Avenue, Cleveland; and in northern California, the **Allan P. James Co.**, 419 Tenth Street, San Francisco.

The Fletcher F. Milligan Company, 4614 Prospect Avenue, Cleveland 3, has been appointed northern Ohio sales representative of The Cleveland Tapping Machine Company, Hartville, Ohio. **E. G. Gauspohl and Associates**, 2712 Erie Street, Cincinnati 8, is now Cleveland representative in southwestern Ohio, southern Indiana and Kentucky with **Breen & Ahlers Sales Company**, 927 Brookview Avenue, Dayton, Ohio, acting as sub-agent in the territory adjacent to Dayton and Columbus.

Cleveland Tapping has also reaffirmed **The Manufacturers Sales Company**, 9120 Livernoise Avenue, Detroit, as its Michigan Sales representative, **Ray A. Hughes**, 6107 North Sioux Avenue, Chicago 30, Ill., as representative in northern Illinois and Indiana and eastern Iowa and **Merit Machine Tool Company**, 225 East Detroit Street, Milwaukee 2, as representative for the state of Wisconsin except the extreme western part.

"This multiple drill head has increased our torch cone end production by about 600%."



Drilling 6 holes $1\frac{1}{8}$ " deep—No. 45 Drill, 28 strokes in 1 min. 10 sec.



⌘ #45 DRILL SIZE

When this MULTI-DRILL went into operation with a seven-station full automatic step drilling machine, welding torch cone end production at the Victor Equipment Co., manufacturers of gas welding and flame cutting equipment, went up "about 600%."

Why not see how your production can be increased with a MULTI-DRILL—the production drilling head designed for accurate high speed drilling? Available with 2 to 8 spindles; quickly and easily adjusted to any hole pattern on or within a 9" circle; $\frac{1}{8}$ " min. center distances. Drill sizes $1/32$ " to $3/8$ ". Special adaptations available.

Write for details and name of your nearest Distributor

COMMANDER MFG. CO.
4227 W. Kinzie Street • Chicago 24

Product of *Commander* — Builder of the *Commander Tapper*

Producers of SCREW MACHINE PRODUCTS to specifications.

We know **our** equipment.

Can we assist in designing your screw machine products for adaptation to our equipment?
Automatics—2½" Rd. capacity, Turret Lathes—3" Rd. capacity. Castings & Forgings machined to a maximum diameter of 10", length 8", weight 15 lbs.

We are also equipped for Milling, Drilling, Threading & Tapping. May we quote?

SCREW MACHINE SPECIALTY CO.
5637-43 Butler St. STerling 2235 Pittsburg 1, Pa.



A REAL HELPING HAND

It's a help that die makers, tool makers, machinery builders and general machinists have long sought—a more accurate and surprisingly faster way of transferring blind screw holes.



The Heimann Transfer Screw Set is a self-contained, complete tool. No wrenches or pliers are necessary. Made in ⅜" to 1" diameters. Send for price list.

HEIMANN MFG. CO.

332 Lincoln Ave.

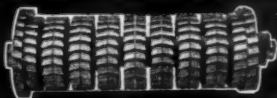
Urbana, Ohio

CUT YOUR COSTS! (THE EASY WAY)

Send your cutting tools in today for Sharpening, Salvaging, Reconditioning.

SAVE UP TO 70%

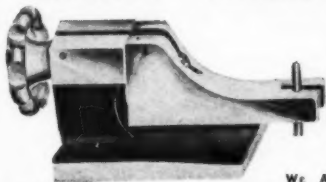
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13006 GREELEY



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DETROIT 3, MICH.

MIGHTY MIDGET RADIUS DRESSER

PUT ONE ON EVERY SURFACE GRINDER



\$29.00

Less Diamond

* HARDENED SHAFT —
BEARING ADJUSTABLE
FOR WEAR.
DIAMOND ALWAYS
CLAMPED PERFECTLY
IN PLACE.

ORDER DIRECT

ON OUR 10 DAY MONEY BACK GUARANTEE

We Also Mfr. The "Mighty Midget" Demagnetizer—\$9.00

SPERMAN METAL SPECIALTIES 2199 E. 21st ST., BROOKLYN 29, N. Y.

The TRANSA

GUN TYPE SAW



At last, a saw which cuts anything, stainless steel, rubber, wood, aluminum, etc. Blade has a variable speed which is set in 45 seconds . . . the stroke length of the blade is adjustable depending on thickness of materials. Transa has

twice the power on the cutting stroke due to a special gearing arrangement.

Special guides for each width of saw blade eliminate whipping, turning or cracking the blade, and acts as a cutting

guide at the same time. Transa guns are used extensively in machine shops, assembly plants, fabricating industries, repair and shipping departments.

Write for free bulletin.

TRANSA INC.

440-45 Gateway Bldg.
Minneapolis, Minnesota

RESHARPENING DULL TAPS FOR MORE EFFICIENT OPERATION

The Greenfield Tap and Die Corp., Greenfield, Mass., offers the following advice on resharpening and grinding taps. Dull taps are liable to chip, break, produce rough and poor threads, cut over-size, cut much harder, and slow down the tapping machine.

If the resharpening must be performed manually, a new tap should be on hand for comparison. A soft 80 grain grinding wheel is ideal for performing the work.

Occasionally, grinding in the flutes may

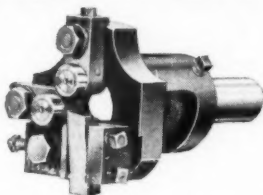
be necessary to sharpen the cutting edges of the threads or teeth. In this case, the tap may be mounted between centers upon a universal grinder and passed back and forth under the grinding wheel. To hold the tap steady and secure, the back face of the land can be held against the blade of a universal tooth rest. When the cutting face is to be ground is radial or has a straight rake, a hard 60 grain grinding wheel should be used of the saucer or dish type.

If the cutting face is hooked, a straight disc grinding wheel is best and its periphery should be formed to suit the type of hook necessary. Accurate forming or dressing of the grinding wheel can be accomplished with a diamond, taking cuts no deeper than .001" or .002" per pass.

In grinding by hand, the operator should pass the tap under the grinding wheel, as nearly as possible at right angles to the axis of the grinding wheel spindle. The original outline of the flute in the tap can be used as a guide for shaping the wheel.

Light grinding cuts eliminate the burning of cutting edges. When tapping materials that tend to load, the ground portion should be polished after grinding. The operator should always completely remove broken teeth or threads in the tap; otherwise, they will damage the threads in the tapped hole. The efficiency of the tap will not suffer.

WATSON Tangent Cut Box Tool



A general purpose, tangent cut, roller rest box tool of wide range for turning diameters from bar stock castings, forgings or other material. Applicable to all sorts of screw, turret and other machines, hand or automatic. It is simple to set and eliminates resetting when it is necessary to grind the bit. Write for descriptive folder giving complete information.

The Watson Mfg. Co.

2220 ALBION ST. TOLEDO 6, OHIO

SAVE DOWN-TIME ON DIES

"Industrial"

COMPENSATING

SPACERS



For quick-easy adjustment on strippers, pressure pads, etc. Fit shoulder and standard screws. Precision made of hardened spring steel. Save making spacers, wire rings, shortening screws, etc.

PRICES per 100 f.o.b. CHICAGO

Size	ID	OD	Thickness	
			1/32"	1/16"
3/4"	.750	1.000	\$1.52	\$1.95
5/8"	.625	.875	1.43	1.75
1/2"	.500	.750	1.08	1.35
3/8"	.375	.562	.87	.95

600 Assorted and Indexed on 8" x 8" Metal Wall Rack **\$7.85**

PROMPT SHIPMENT

SATISFACTION GUARANTEED

INDUSTRIAL TOOL WORKS

1348 W. Henderson St.

Chicago 13, U.S.A.

BAUMBACH THE DIE SET AUTHORITY



All Baumbach Die-Sets have demountable Leader Pins and Bushings. This exclusive feature permits removing Leader pins for machine work on the die shoe and assures reassembly without loss of alignment. A big time and trouble saver. Write for Catalog.

E. A. BAUMBACH MFG. CO.
1810 S. KILBOURN AVE. CHICAGO 23, ILL.

LOW COST LOCATING BY CENTER SCOPE

*Dependable
Accuracy.*

Ample Adjustment

For Spindle
Run-Out.
For
Drill Presses,
Lathes, Mills.

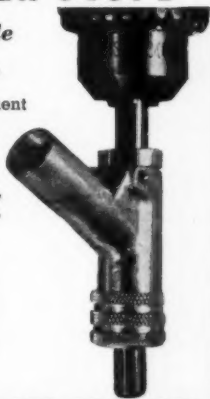
SERIES "M"

\$24.50

CASE EXTRA

\$3.50

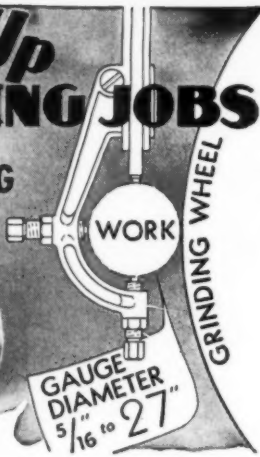
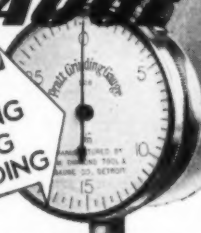
Bulletin M-8
CENTER SCOPE PRODUCTS
3829 San Fernando Rd., Glendale 4, Calif.



Speed Up GRINDING JOBS

With Automatic
DIAMETER INSPECTING
GAUGE

VISUAL
READING
DURING
GRINDING



Pratt Grinding Gauges caliper external cylindrical jobs while work is in motion or at rest. Adapted to straight or tapered work. Tolerances of .0001" plus or minus easily maintained. Visible check on out of roundness, rough grinding and chatter. Cannot grind work undersize unknowingly. Easily installed on any grinder. Pratt Grinding Gauges increase production, eliminate scrap and assure accuracy. A modern precision tool, ruggedly built.

Send for Bulletin

American

DIAMOND TOOL & GAUGE CO.

15920 WOODINGHAM • DETROIT 21, MICH.

STEEL IN CHEMICAL INDUSTRY

(Taken from booklet "Allegheny Metal in Chemical Processing.")

Stainless steel and the chemical industries have advanced, hand in hand, with giant strides over the past quarter of a century. In many cases, the development of a proper grade of stainless steel made possible the practical application of a new chemical process, just as many types of stainless steel were perfected with the aid of suggestions advanced by chemical engineers. Such coordination of effort

resulted in a remarkable history of cooperation between the chemical process industries and the stainless steel producers, and stainless steel for chemical plants has since remained a major production item.

The ready acceptance and widespread use of stainless steel by the chemical process industries are not hard to understand. Chemical engineers seek mainly two kinds of strength in materials of equipment construction. They want physical strength to carry stresses occasioned by pressures and to provide structural rigidity. They must have materials with sufficient strength to stand up under corrosive conditions and high pressure oxidation, not only to insure long service, but to avoid product contamination.

Stainless steel provides an economical combination of these two types of strength in one material, made available in a wide

range of forms for ready fabrication. The term "stainless steel" is a family name for a large group of steels with a varied assortment of properties, which afford the chemical industry versatile and valuable materials of construction. Their many physical or mechanical properties allow the design engineer to satisfy requirements for tensile properties, fatigue and impact strength at low, normal and elevated temperatures. They provide an extensive selection from the standpoint of their abilities to resist corrosion or oxidation.

SELF-SEALING TEST PLUGS AND FILLING CONNECTORS

A new line of "Hydro-Matic" Self-Sealing Test Plugs and pressure line Filling Connectors equipped with expanding head pull rods is announced by Mechanical Products Corp. Employing a unique sealing principle, and requiring only a couple of seconds to insert or remove, the Plugs and Connectors are designed to seal plain or threaded holes in flanged or fitted openings of practically any depth in tanks, boilers, and other vessels which require hydrostatic or air pressure testing. Illustrated is the type "G" Filling Connector.

A safety feature and positive holding action is controlled by the bayonet lock in the cylinder, which prevents use of Plugs or Connectors until the expanding heads are properly anchored or engaged against the inside edge of the flange or fitting and the plunger is free to be actuated by the internal testing pressure to force and hold the neoprene seal firmly against its seat.

The units are designed with ample overload factors to withstand continuous use at any recommended testing pressure. Stock sizes for 1/4" to 2" pipe openings are available for standard

flanges, and are suitable for any testing pressure to 500 p.s.i.

Mechanical Products Corp., Dept. BB
168 N. Ogden Ave.
Chicago 7, Ill.



METALLIC GASKETS HAVE ASBESTOS FILLER

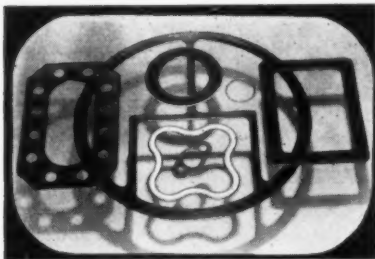
The U. S. Gasket & Shim Co. has announced the development and production of a line of metallic gaskets for use in every field of industry using liquid and gas service equipment. Fabricated of a variety of ferrous and nonferrous materials, they are filled

the yielding, or flow, of the gasket material into the imperfections of the mechanical assemblies.

The largest shown in the illustration, and medium size gaskets located left and right, are of double-jacket type. Their asbestos filler material is enclosed in a metal sheet covering one face, extending around inner and outer edges, and lapping over edges of metal washer which covers the opposite face.

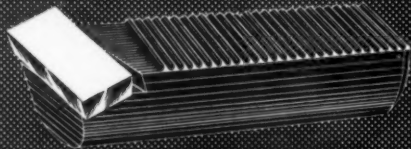
The round gasket at top center of photo is made by flanging a metal jacket over the inner edge and both faces of the asbestos filler. Clover-leaf shaped gasket, low center, is of single-jacket design and consists of filler partially enclosed in a metal shell which covers one face, both edges, and such portions of other face as is desired. The small round gasket, is made of asbestos filler enclosed in a single jacket with desired portion of material left exposed. For details, write:

The U. S. Gasket & Shim Co.
203 Hibbard Bldg, Dept. BB
Cuyahoga Falls, Ohio.



with a soft asbestos to provide maximum sealing and protection against extreme pressure, heat and corrosion. They will withstand temperatures up to 850° F., and pressures up to 1500 lbs. p.s.i. The seal is accomplished by

ANNOUNCING



NEW No. 50-18 BLADES

The "New Look" for Type "A" Lovejoy Mills

Here is a new T.C.T. negative rake blade that will make your oldest Lovejoy milling cutter housings as modern as tomorrow. Yes, it has the same shank size as every Type "A" blade ever made—whether T.C.T., cast alloy or H.S.S. The tip is set so that it really shears steel and cast iron and tosses the chips out. It requires less horsepower than most common blades—it produces cuts with fine finish.

Compare These Results—A recent test with **NEW #50-18 blades** in a 20-year old Lovejoy Type "A" housing gave the following results—**MATERIAL: 3140 — OPERATION: face 2" wide x 12" long — SPEED: 365 R.P.M. (490 S.F.P.M.) — FEED: 60" per minute — CHIP LOAD: .014" — DEPTH: 1/4" — FINISH: good.** After 5½ hours cutting time the blades did not require sharpening.

Lovejoy has blade and cutter styles for all types of milling. For full details write for Catalog No. 28.

Lovejoy

TOOL COMPANY INC.
Springfield, Vermont

URGES UTILIZATION OF NATURAL GAS RESERVES

Unsettled world conditions accent the need for greater utilization of America's natural gas reserve, James E. Pew, manager of Sun Oil Company's natural gas and natural gasoline division, 1608 Walnut St., Philadelphia 3, has stated.

"Yet, as a nation, we seem as uncertain about a realistic policy on natural gas, which is here today, as we are on atomic energy for industrial power, which is a decade or more in the future," he declared in an article in the Company's

magazine, "Our Sun."

Mr. Pew described present natural gas reserves as "surpassing today's record-breaking crude oil reserves on an equivalent heat basis."

Yet natural gas today is supplying only 13 per cent of the nation's energy needs, the article points out.

Largely responsible for this paradoxical situation is a "forbidding, complex web" of municipal, state and federal regulations, Mr. Pew explained.

About 20 percent of all natural gas produced in the United States is wasted—amounting to approximately 400 billion cubic feet a year in Texas alone—because producers have been unable to afford installation of equipment needed to ready the gas for sale on the basis of prices offered for the gas in the field, he said.

The present price of natural gas at the well-head is roughly 12 per cent of the price re-

ceived for crude oil on an equivalent heat (Btu.) basis.

Calling for a more favorable economic and political climate for natural gas, Mr. Pew urged:

Legislative provision for interstate transportation of natural gas on a common carrier basis—with a "willing buyer on one end and a willing seller at the other."

Enactment of legislation which denies to the Federal Power Commission any authority whatsoever over the risk business of oil and gas production.



GET THE WHOLE STORY OF SERVICE WITH A *Punch!*

Allied's 48-page R-B catalog contains complete data and prices on R-B Interchangeable Punches and Dies — recognized and used for accurate, trouble-free punching throughout the metal-working and plastics industries. But that is only part of the R-B story. Also included in this catalog is full information on Allied's "one stop service" which includes retainers, composite die sections, rubber strippers, guide pins and bushings, and miscellaneous die makers' supplies. A copy is available to you without charge or obligation. Write for it today.

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For **COMPACT** Design

Specify

COMPACT DESIGN

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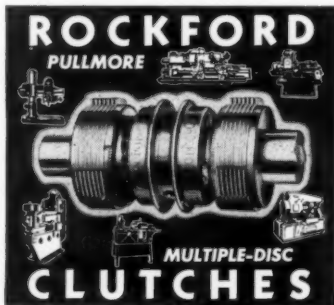
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Send for This
Handy Bulletin

Shows typical installations of
ROCKFORD CLUTCHES
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diagrams of unique applications, furnishes capacity tables, dimensions and complete specifications.



ROCKFORD CLUTCH DIVISION

BORG-WARNER

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Pullmore Clutches are sold by Morse Chain Co., offices in principal cities.

AROUND & AROUND

Increased production depends on a satisfactory Diamond Tool. Tool life, speed of cut, increased production depend eventually upon the diamond tool. JKS Diamond Tools are giving entire satisfaction on practically every make of machine tool. 155 types are available for dressing and truing operations. The model illustrated is the STA-KOOL with internal cooling ducts and external cooling fins.

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6400 Tireman Ave., Detroit 4, Mich.
129 Adelaide St. West, Toronto, Ont.

ATOMIC ENERGY PROBLEMS DEMAND ENGINEERING SKILL

Dr. O. C. Simpson, associate director, chemical division, Argonne National Laboratory, Chicago, called upon the nation's engineers to turn their professional skills to the solution of many problems of atomic energy research, declaring:

"It is highly essential that the number of technical people with atomic energy research know-how be greatly expanded if the United States is to retain its pre-eminent position in this field."

Speaking before The American Society

of Mechanical Engineers, 29 W. 39th St., N. Y. 18 at a luncheon featuring its Semi-Annual Meeting, on "Some Engineering Problems of Peace-Time Atomic Energy Research," Dr. Simpson defined eight large general problems as follows:

The design and construction of a "more versatile" 60-inch (magnet) cyclotron in which the type of bombarding particle and its energy can be changed at will.

The design of a nuclear reactor for the production of useful power, including the development of a high temperature refractory, such as ceramic materials, for use in place of metals.

The engineering of simpler, cheaper, and more versatile apparatus for isotopic separation work.

Remote control engineering which "may be the most important single field in the future development of atomic energy."

This would include an "automaton" with apparatus to carry on operations in an air tight structure heavily shielded against the deadly radiation damage.

Problems of shielding which "will play a major role in any use of a nuclear reactor as a mobile power source."

Air conditioning and ventilation of radiochemical laboratories, necessary for use with hazardous gases or radioactive particles of matter.

New chemical problems which have arisen in dealing with radioactivity.

Sanitation engineering for the atomic age.



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AND SOLID BAR . . . BENDING TABLES ALSO AVAILABLE**



Above: Hand powered Type A-30 . . . up to 180 bends . . . all sizes from $\frac{1}{2}$ " to 2". Only 7 parts. World's fastest, simplest machine. Note assortment of bending dies . . . this process makes shorter tangents than any other. Occupies only 18" by 18" floor space!

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For residential work—at 6" and 9" radius bends on $\frac{1}{2}$ " and $\frac{3}{4}$ " pipe.

For industrial sizes — at 6" and 9" radius bends on 1" and $1\frac{1}{4}$ " pipe.

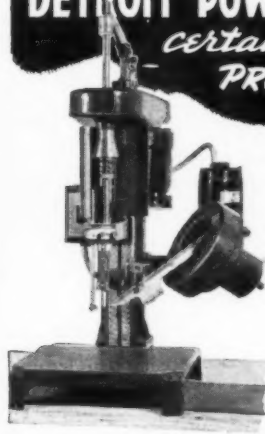
All the above bends and sizes are specified and accepted by most heating engineers and contractors.

Furnished as extras if required on our Type A-30.

"American"
PIPE BENDING MACHINE
Company INC.

DETROIT POWER SCREWDRIVERS

*certainly help Our
PRODUCTION!*



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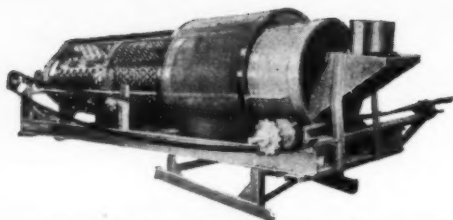


If you have a production screw-driving problem, by all means investigate these modern, time, labor and money-saving machines. 3 models to drive screws from No. 2 to $\frac{5}{8}$ " diameter. No marring of heads, no stripping threads, all screws driven to uniform tension.

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**2809 W. Fort Street
Detroit 16, Michigan**



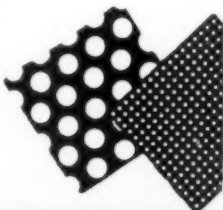
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Rogers Iron Works Co., Joplin, Missouri, relies on H & K Perforated Metals in the manufacture of their well known line of Revolving Screens and Scrubber Screens. Requirements of the various materials to be screened makes the precision accuracy of these perforations important. Holes are uniform in size, shape and spacings. Surfaces are smooth and easily kept clean.

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U. S. STEEL (SO. CHGO.) INCREASES ANNUAL OUTPUT BY 560,000 TONS

U. S. Steel's postwar modernization and improvement program in the Chicago district moved into high gear when the first iron was made by the second of two giant blast furnaces at the South Chicago plant of the subsidiary Carnegie-Illinois Steel corporation. Both of the new blast furnaces rank among the world's largest and have a daily capacity exceeding 1500 tons of iron.

The two blast furnaces at the South Chicago plant are No. 11, replacing the

smaller dismantled No. 7, and No. 12, replacing No. 9, also a much smaller installation. Completion of No. 12, preceded several weeks ago by No. 11, gives the plant an increase of 560,000 tons of iron annually to make the plant's yearly iron capacity total 4,200,000 tons.

A. C. Wilby, Chicago vice-president of United States Steel Corporation of Delaware, (208 S. La Salle St., Chgo. 90) said:

"The furnaces are part of United States Steel corporation's \$775,000,000 development program in which virtually all operations, from ore and coal mines to sales offices, are sharing from coast to coast. Other improvement projects in the Chicago district, which are underway and to be completed as rapidly as possible, include the following:

1. Increase in the cold rolled strip and tin plate productive capacity at the Gary (Ind.) sheet and tin mill.

also a Carnegie-Illinois plant, scheduled for completion during the fourth quarter this year.

2. Additional tube-making facilities at the Gary works of National Tube company, scheduled for completion in the first quarter of 1949.

3. A new stainless steel wire mill at Waukegan (Ill.) works of American Steel and Wire company, scheduled for completion during the third quarter this year.

The corporation elsewhere is pursuing a program of replacements and improvements in its iron, coal, coke and steel-producing facilities.

CUTTERS



Hand Power Lever Action
RODS for FLAT BARS ANGLES
WIRE ROPE
Send for circular.
T. H. LEWTHWAITE MACHINE CO.
 312 East 47th St., New York 17, N. Y.

**SAVES
 TOOL MAKERS' TIME
 TROYKE
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**EXACTLY
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with MAJESTIC DRILL SHARPENER

Now you can always have perfectly sharpened fast-cutting drills that really take the proper bite and cut smoothly without chatter. Simply turn the Automatic Dial Control, and Majestic Drill Sharpener is set to grind both cutting edges and both angles exactly alike. Take any size drill from 5/32" to 1", straight or No. 2 taper shank. Fits any grinder. Adjustable to grind drills for cutting hard or soft materials. The Majestic Drill Sharpener is a real production tool that assures longer drill life, speeds up the work and quickly saves its cost in factories, garages and repair shops. Price \$10.95 F.O.B. Factory, ask your supply house, or order direct. Many thousands in use. Circular on request.

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Stop losses from bent rivets, imperfect heads, loose joints, broken or marred work pieces . . . install an Airflex Pneumatic Riveter.

Rotating peen distributes 5,000 to 7,000 straight-line hammer blows per minute "around the clock." Striking first at A, then at B, etc., each impact is limited to a small cross-sectional area of rivet. No more trouble with slender, unsupported, or hollow rivets . . . no risk riveting in glass, plastics, ceramics, etc. Twelve models, bench and floor types, standard and double end. Interchangeable hammer units. Send for Bulletin 74.

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"IN THE HOOSIER STATE SINCE 28"

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HOW A BOWL AND WIRES PRODUCED AN INDUSTRY

One of the great romances of industry concerns the creation of the first man-made abrasive, silicon carbide. "Carborundum" was the name applied to the abrasive. This is also the trademark of The Carborundum Company of Niagara Falls, New York.

In a little room in a building located at Monongahela City, Pennsylvania, in 1891, Dr. Edward Goodrich Acheson began his experiments of creating an abrasive material that would be harder, sharper and

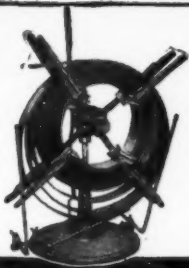
faster cutting than those abrasives created by Nature herself. He was attempting to produce a form of crystalline carbon which would have some of the properties of the diamond and would be useful for its abrasive properties.

He impregnated clay with carbon under a high temperature produced electrically. His was crude equipment. An iron bowl such as plumbers use for the melting of solder was the foundation for a tiny electric furnace. Two wires ran from an electric power plant in the basement; one was attached to an electric arc light carbon and the other was wound around the iron bowl.

Into a mixture of clay and powdered coke, he inserted a carbon rod. The coke carried the strong current which passed through the mixture, and a high temperature was produced which in turn melted the clay.

After allowing the mass to cool, he removed the carbon rod, and saw at first only a dull-looking mass of fused material. On looking closer, however, he spied sparkling crystals at the end of the rod.

He collected the tiny crystals on the end of his pencil and drew them across a glass surface. The crystals cut or scratched the glass as readily as a diamond would have. He produced more of the crystals and mounted them on an iron disc, first lightly smeared with oil, and was able to cut the facets of a diamond in his ring with the disc.

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for faster Production

LITTELL Automatic Centering Reels are constructed with four arms which operate all at the same time. A free loop of material is supplied to automatic feed, regardless of weight of coil.

Littell Reels are made in 100-lb. to 20,000-lb. capacities. Automatic spindle and cradle types. Plain and motor-driven. Used in thousands of plants for faster production.

Other Littell products include Roll Feeds, Dial Feeds, Magazine Feeds, Air Valves, Straighteners, Scrap Winders, Pres-Vac Safety Feeders, **REQUEST BULLETINS.**

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No. 375— $\frac{3}{8}$ SCREWS IN SETS OF 3—\$16.50

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Cut KEYWAYS Safely
with **The GLENNY**
Adjustable Expansion **PUSH BROACH**

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Safe from rejects thru error—the Glenny assures maintained accuracy on all work.

Safe from rejects due to scoring of the bore.

Safe from blade breakage because sleeve of broach protects blade when tool is under pressure.

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Kempsmith Plain Index Centers for production and general indexing . . . simplify job set-ups . . . relieve the operator of the necessity of counting or making any calculations. Indispensable in milling taps, reamers, small gears, sprocket wheels, special grooving, etc. Described in Bulletin No. 124.

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KEMPSMITH

Precision Built Milling Machines Since 1888

ADVANCE SCIENCE, ENGINEERING BUSINESS METHODS

Large scale computers now being built or in prospect, with phenomenal new speeds in solving complex mathematical problems and with greatly expanded "memories" storing up data for use as needed, will be used by man for countless advances in science, engineering and industry. This information was disclosed at the Semi-Annual Meeting of The American Society of Mechanical Engineers, 29 W. 39th St., N. Y. 18.

Dr. Harry D. Huskey, head of machine



KEMPSMITH ARBORS

in all popular sizes or types. Adaptable to ANY make of milling machine with standardized spindle.

development of the applied mathematics laboratories, National Bureau of Standards, Washington, D. C., described present and projected electronic digital machines, the speediest of all types. He said that the new ones will become "an order of magnitude more powerful than previous machines," and will be worth "a quarter of a million dollars" in solving problems with paper and pencil. Dr. Huskey was a consultant for ENIAC (Electronic Numerical Integrator and Computer) the first electronic machine built.

One of the spectacular new uses may be for accurate long range weather prediction. Other extended uses of the new machine will be for nuclear and aerodynamic studies, military science as in ballistics and signal corps work, statistical work such as that performed by the Census Bureau, and many forms of complex mathematical problems.

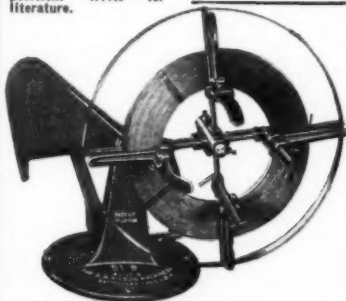
"An example of what is expected of future computers is given by a request of the Air Force for a machine to solve a thousand equations having a thousand unknowns—quickly."

ENIAC, the first electronic computer, with 18,000 tubes, is still the speediest, the speakers said. It was built for the Army Ordnance Department at the University of Pennsylvania, and designed chiefly for computing firing tables. It is now installed at the Ballistics Research Center at Aberdeen Proving Grounds. Improvements now seek to increase memory capacity and decrease breakdowns.

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\$84.00

FIVE TONS of smooth power is at your service with this compact and versatile tool.

The perfect press for garage, electric motor shop, refrigerator repair and machine shop.

Will operate lying horizontal.

Ram has removable anvil and retracts itself when released.

Stroke 5 1/2"

Weight 100 lbs.

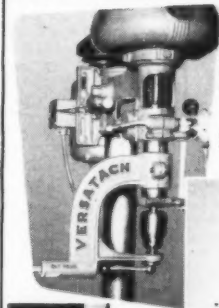


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- Also Does:**
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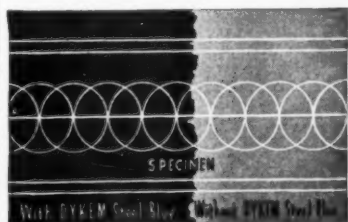
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Price Complete with One 3/16" File and Holder **\$29.75** POSTPAID

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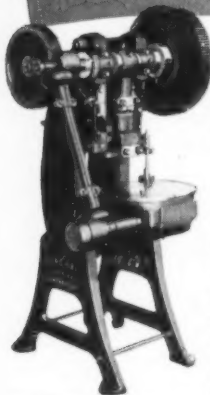
Simply brush on, right at the bench; ready for the layout in a few minutes. The dark blue background makes the scribed layout lines show up in sharp relief, and at the same time prevents metal glare. Increases efficiency and accuracy.

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THESE *dial feed* PRESSES



Available in 8 sizes—
Capacity 6 to 80 tons

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Federal Dial Feeds are known for fast, safe, smooth operation—capable of producing scores of items which formerly required special machinery of limited utility. High speed, greater accuracy, reduced maintenance can save up to 75% in production costs depending on type of work. Built to withstand hardest usage, Federal Dial Feeds may be the answer to your produc-

tion problem. Write today for catalog on complete line.

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IRON ORE PRODUCTION SETS PEACETIME RECORD

Records were set last year in the production of iron ore in the United States, according to the American Iron and Steel Institute, 350 Fifth Ave., N. Y. 1.

Production of iron ore in the United States during the year totaled 93,248,000 gross tons, a peacetime record which exceeded the previous peacetime top by almost 20,000,000 tons.

The high level of iron ore output in the United States was accompanied by record exports of 2,817,211 gross tons, most of which went to Canada. Our imports

from the Dominion also set a record at 1,539,787 gross tons.

Total United States imports of iron ore during 1947 at 4,893,176 gross tons set a record that doubled the prewar annual tonnages imported. Chile supplied about one-third of total imports with its tonnage of 1,673,923 gross tons. But while imports from Chile were slightly below the 1940 prewar peak, imports from Canada were seven times the 1940 level, reflecting the steadily increasing iron ore output of Canada.

Several United States steel companies have taken an active interest in the development of high-grade iron ore fields in Canada. They are also investing millions of dollars in new facilities and experimental work in connection with the processing of low-grade taconite ores and the expenditures of additional millions toward the development of ore deposits in various

Latin-American countries.

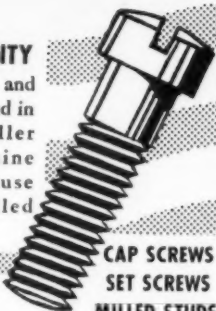
The most talked of among the new North American deposits is the Labrador ore field, where drilling is under way to establish the existence of at least 300,000,000 tons of iron ore deposits.

Lake Superior iron ore accounted for 82 per cent of the United States total production last year. Western states set a record at 4,300,000 gross tons for the year.

The Southeastern ore producing states, Alabama, Georgia and Virginia, increased their output to 7,816,000 gross tons, 25 per cent over 1946.

CONCENTRICITY

of head, body and thread is assured in every Ottemiller Screw Machine Product because they're "milled from the bar."



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SET SCREWS
MILLED STUDS
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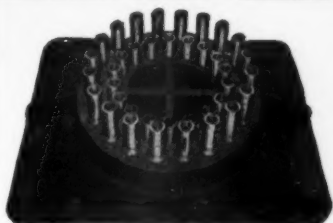
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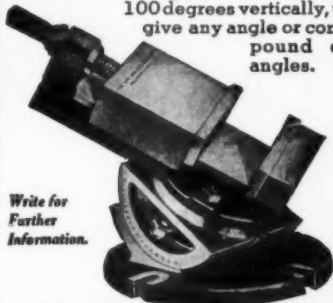
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Swivels 360 degrees horizontally,
100 degrees vertically, to
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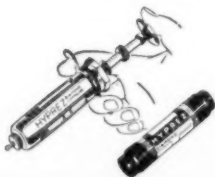
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HYPREZ DIVISION

ENGIS EQUIPMENT COMPANY

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PROVIDE PARALYZED VETERANS WITH GRANTS FOR HOMES

The President has signed into law H. R. 4244, which provides certain paralyzed veterans with Federal grants up to \$10,000 for purchasing or remodeling homes especially designed for wheel chair living, Veterans Administration announced.

Eligible under the law are veterans of war or peace who served in the armed

forces since April 21, 1898, who have a permanent-total service-connected disability, due to a spinal-cord disease or injury, resulting in paralysis of the legs and lower part of the body.

The purpose of the law is to provide these disabled veterans, who must spend a major part of their lives in wheel chairs, with homes especially adapted to their needs.

The special features which may be incorporated in such homes include ramps, instead of steps or stairs, extra-wide halls and doorways, larger rooms, special bathroom arrangements and fixtures and, in some cases, exercising facilities.

In determining the eligibility of applicants, VA is required to ascertain that it is medically feasible for the veteran to live in the house, that its cost bears a proper relationship to his income, and that it is suitable to the particular veteran's requirements.

VA also is authorized to supply, free of charge, model plans and specifications.

Veterans who qualify are entitled to a grant, not to exceed 50 percent of the total cost, maximum, \$10,000, with which to buy or build a new home, to remodel an existing home, or to liquidate indebtedness for such a special home already acquired. Each veteran is limited to a single housing unit.

USE ECONOMY

Headless
Set
Screws



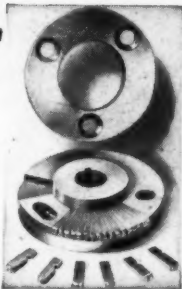
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Try Them On Your Next Job!

ECONOMY MACHINE PRODUCTS COMPANY

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ACCURATE
METAL
MARKING
with
ACME*



INTERCHANGEABLE TYPE ROLLERS

Now you can have the advantages of roller dies combined with the flexibility of interchangeable type. Rolling gives you the best control over depth of marking impression because only one character is marked at a time. You get minimum distortion in material marked. You can also change copy at will. Special compensator segment with elongated hole locks lines of various lengths; eliminates need for spacers. It also eliminates all play in inserts so that impressions come up clear and distinct. Details are given in Acme Catalog GC-1247. Write for free copy.

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Timken Mounted
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Modern Design—
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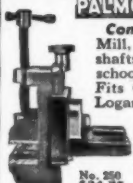
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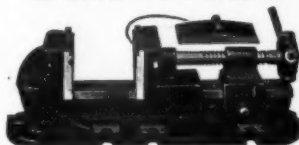
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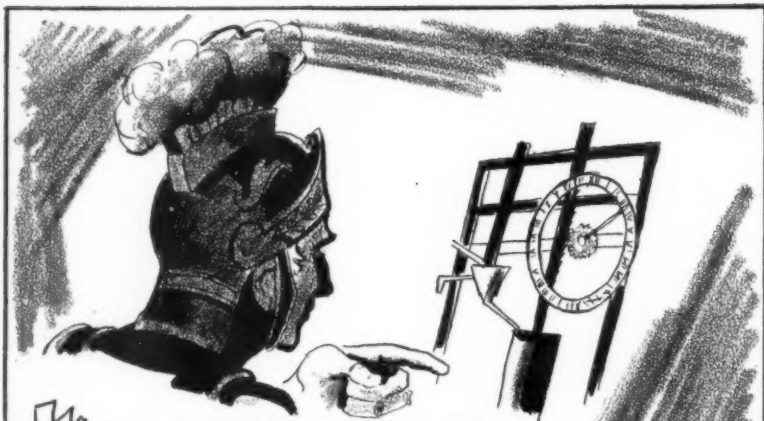
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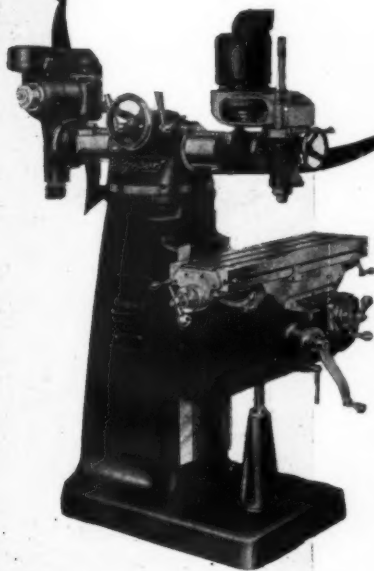
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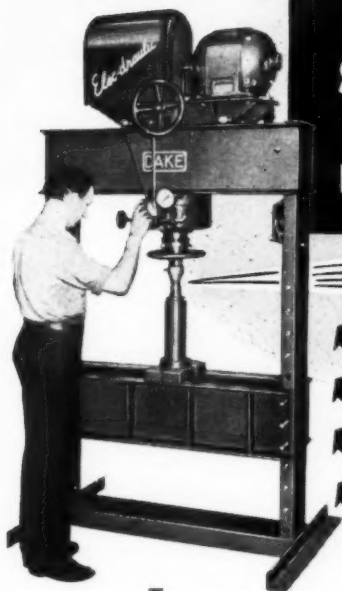
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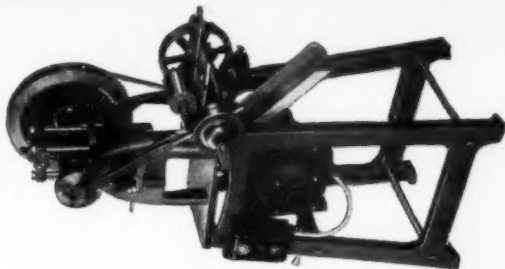
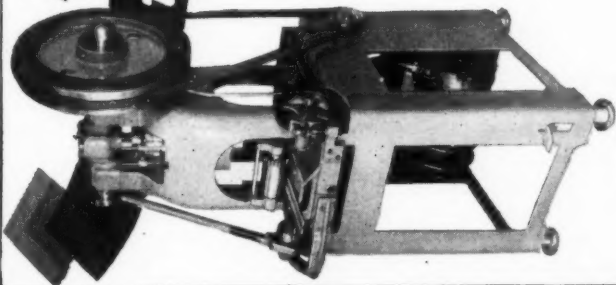
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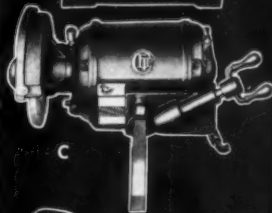
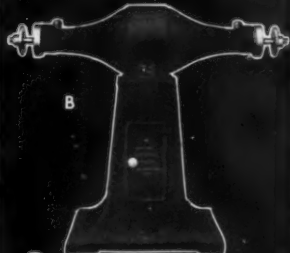
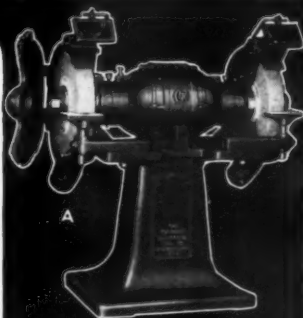
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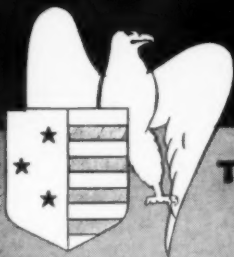
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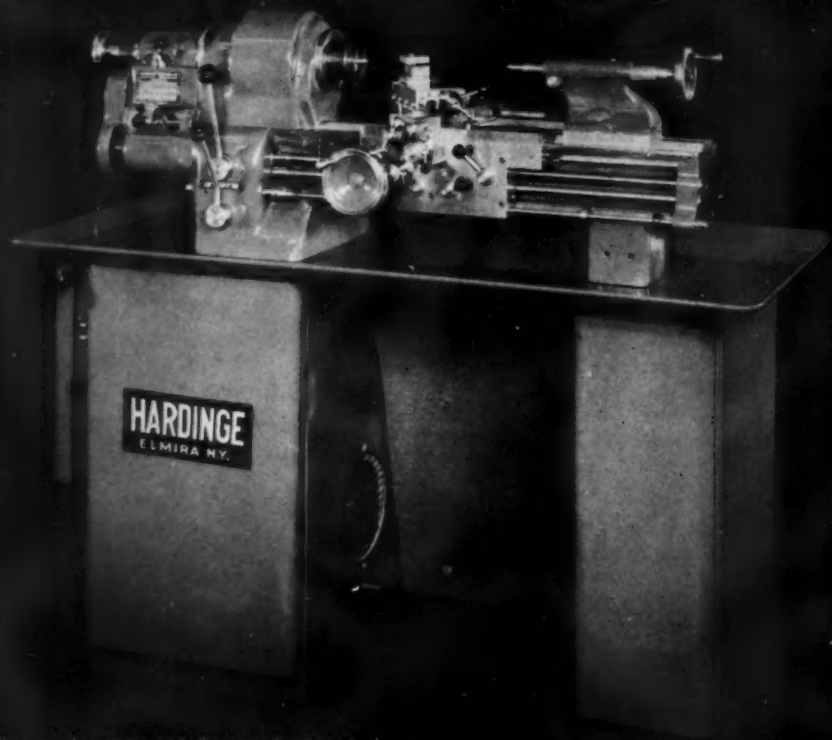
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